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[*Authors alone are responsible for the contents of their respective Papers.*]

THE LADYSMITH PIGEON POST.

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IT has been, perhaps, hastily assumed that the South African campaign has taught many new lessons to soldiers. When, however, sufficient time has elapsed to arrange the events of that war in their proper form and relative proportions, it will probably become apparent that whatever changes in the details of tactics were necessitated by improvements in armament, the physical features of the theatre of operations, and the exceptional mobility of the enemy, yet the main principles of war have been once more forcibly illustrated, and found to be as unchanged as ever.

One of these main principles which are as true now as they were in the time of Cæsar, is the importance of the means of communication for the acquiring and transmitting of intelligence, and for the issue and receipt of orders.

The means of communication in the field may be classified under the following heads:—

- a.* Telegraphs and telephones.
- b.* Military posts.
- c.* Despatch riders.
- d.* Runners, *i.e.*, dismounted messengers.
- e.* Signalling by flag, helio, lamp, or search-light.
- f.* Pigeon post.

Of these, during a siege, the invested force can at the best only avail themselves of the last three. Of these three, a vigilant enemy may, by the closeness of his investment, make the issue of runners from the besieged place almost impossible, although modern tactical conditions have in fact rendered such close investment an improbable event.

Signalling, again, is dependent entirely on the distance at which the enemy is able to keep the relieving force from the besieged. In the early days of the sieges of both Ladysmith and Kimberley, and throughout the siege of Mafeking, signalling with the outside world was an impossibility.

A pigeon post is, however, practically free from both these limitations. No closeness of investment will prevent the trained bird darting in rapid flight over the investing lines, and the long range of modern guns and rifles will to the last extremity keep the enemy at sufficient distance to ensure that the birds will have attained considerable altitude before passing over the besieger's lines, and so render shot-guns useless against them. A good bird gets up high at once. With pigeons, moreover, trained to fly a distance of 300 miles in a day—a feat within their powers—the place of homing must have been badly chosen to fall within the area of the enemy's operations.

Having in view therefore these considerations, it is thought that some account of the arrangements made for a pigeon post during the siege of Ladysmith and the results attained may be of interest, more especially as it was the first instance in our military annals of the use of pigeons during a siege, and, except for short distances during the Sierra Leone operations in 1898, the first occasion of their employment at all in our Service in war.

Soon after the arrival of Sir George White in Natal the Durban Homing Society most patriotically offered the loan of their birds to the military authorities. This offer was by the G.O.C.'s direction accepted, and arrangements were made securing the services of two members of the society—Messrs. Hirst and Wright—to take entire charge of the feeding and flying of the birds. Without these gentlemen's expert assistance but little advantage would have ensued, it being essential to success that the birds should be in trained hands both for their management and flying.

Lofts were prepared at Ladysmith, and on 21st October 25 trained birds and 69 untrained birds, all belonging to pigeon-owners at Durban, were sent up by train with Mr. Hirst and his assistant. The trained birds were tossed for a trial flight on 24th October. All returned safely to Durban, and were at once sent back to Ladysmith by rail with 33 other partially-trained birds, which had, however, unfortunately not been trained further north than the Highlands, a station 45 miles south of Ladysmith.

Of the fully-trained birds some had been raced from Johannesburg to Durban, a distance of nearly 300 miles.

All the birds were colonial bred from good racing stock imported from England. They were, therefore, valuable pigeons, and their free loan to the Field Intelligence Department was a substantial act of patriotism on the part of their owners.

The untrained birds could, of course, be allowed their freedom very soon after arrival at Ladysmith, and when they felt thoroughly at home the training was taken in hand, and they were flown from all parts of the compass from a distance of from 3 to 4 miles. Unfortunately, the time before the investment commenced was too short to permit of training for a more extensive distance. But so far as the limited area available permitted, their training was kept up during the siege with a view to the possibility, as soon as Ladysmith was relieved, of their being utilised for cavalry reconnaissances, as has been recently done at the French manœuvres.

The trained birds could not, of course, be let out, except when their services were required. They were unavoidably kept in a somewhat small loft, which, though roomy enough for health, was not large enough to allow of sufficient exercise to keep the birds in flying condition. The birds therefore gradually deteriorated in this respect, as the siege went on, and towards the end it was doubtful if any were fit for the long journey to Durban.

It was during the first month, however, before signalling communication was established, that their services were utilised and were of real value, as a supplement to runners.

Between the 4th November and the 1st December, 28 birds were tossed, carrying in all 15 separate messages, the messages being, as a rule (though not in one or two unimportant cases), duplicated. Of these, 17 birds and 11 messages reached Durban; 11 birds and 4 messages therefore miscarried. Of the messages, however, which reached their destination, 1 had been delayed a fortnight in transit and had become undecipherable. Three birds arrived having dropped or pecked off their messages *en route*. The messages (which were written in ink on the special paper used by pigeon-flyers) were generally inserted under an india-rubber ring attached to the bird's leg, and there secured by silk thread. This is the method adopted by the staff of the pigeon lofts kept up by the Admiralty, and it is the best method. In a few cases, however, the message was placed in a quill and attached to the bird's tail feathers. A member of the Durban Homing Club has since suggested to me that the quill may not in some cases have been observed by the owner of the bird on its arrival, and thus an erroneous report may have been made that the bird arrived without a message. The birds being owned privately, homed to private cots scattered amongst the suburbs of Durban, each owner was, therefore, responsible for the recovery of the message on its arrival, and its immediate transmission to the Military Commandant at Durban, who telegraphed it at once to the G.O.C. the relieving force, or to England.

The distance from Ladysmith to Durban is about 120 miles. Unfortunately no exact record of the time of the birds' arrival was kept at Durban, but in one instance at least it has been ascertained that a bird flown at Ladysmith at 5.30 a.m. reached Durban at 11.30 a.m. Except when, for some unforeseen reason, it became suddenly necessary to despatch a message later in the day, the birds were always tossed in the early morning, so as to secure the advantage of the coolest part of the day, when the birds themselves have most vigour.

As regards the missing birds, their loss was probably due to three causes :—

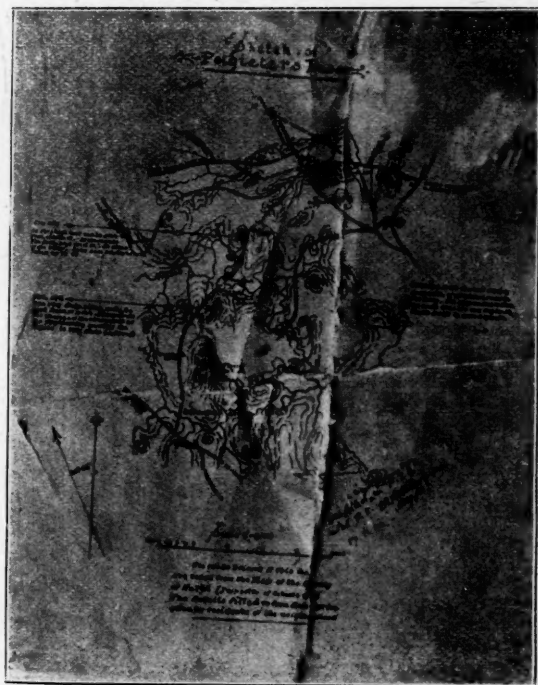
- a. Bad weather. Care was taken to start the birds only on fine, calm days, but a storm near the coast may occasionally have blown them out of their course.
- b. Imperfect training. The secretary of the society assured me after the relief that with a little more time for preparation there would have been a great improvement in the results.
- c. Birds of prey.

The messages sent were as a rule cipher despatches. An interesting exception was the message of congratulation sent by Sir George White in the name of the garrison to the Prince of Wales on H.R.H.'s birthday, which was further celebrated by the discharge of a Royal salute of twenty-one guns from the naval battery into the Boer lines.

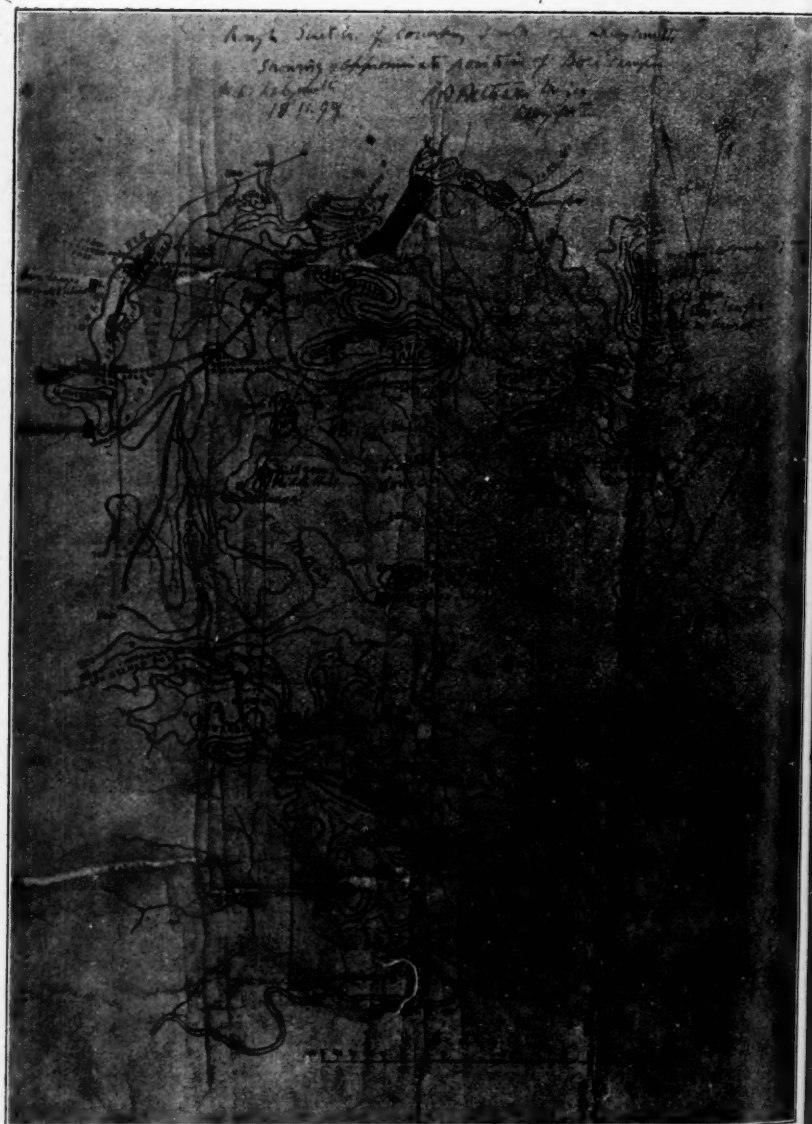
A unique and entirely successful experiment was the transmission of two maps by pigeon post, a feat which probably has not previously been attempted either in peace or war. The maps sent were those now reproduced, the one being a map of Ladysmith (see Frontispiece) showing the Boer positions and guns, but for obvious reasons not showing our entrenchments; and the other a sketch of Potgieter's Drift, which was based on the descriptions of local farmers shut up in Ladysmith. The originals of these were photographed to a very small size, the scale itself being included in the photograph. The photograph was, however, of too great weight to entrust to one pigeon, and was, therefore, cut in half, each half being carried by one bird. Both maps arrived safely, and were reproduced by the Field Intelligence Department of the relieving force. It is worth noting that maps cannot be satisfactorily sent either by signal or telegraph; the experiment, therefore, shows that for this purpose alone the pigeon is of much value. The third map reproduced was similarly photographed to a small size, and despatched by runners. The maps when received were again enlarged by photography.

The results of the use of pigeons in Ladysmith were not quite so satisfactory as those attained by the native runners sent with official despatches, although the percentage of pigeon-post miscarriages was probably less than that of the native runners, who were sent out with press messages and private correspondence. The experience of the siege, however, warrants the belief that with systematic training, results of much value will be obtained from military pigeon-lofts, and the establishment now being started at Aldershot is a mark of the attention which is being paid to the matter by the military authorities.

One possible advantage of pigeons during a siege was not tested at Ladysmith—they were not made into pigeon pie, although the untrained birds increased during the four months to nearly 200 in number. This was an act of considerable self-denial on the part of Mr. Hirst, who, during the middle of the siege was laid up with enteric fever, and when convalescent had to regain strength on "chevrii" and horse flesh.



SKETCH OF POTGIETER'S PASS.
(Sent out of Ladysmith by Pigeon Post.)



ROUGH SKETCH OF COUNTRY SOUTH OF LADYSMITH, SHOWING APPROXIMATE POSITION OF BOER CAMP.

(Sent out of Ladysmith by Runner.)

ON THE RELATION OF PUBLIC SECONDARY SCHOOLS TO THE ORGANISATION OF NATIONAL DEFENCE.

*By the Rev. E. WARRE, D.D., Head Master of Eton, Hon. Colonel
4th (Eton College) V.B. Oxfordshire Light Infantry.*

Wednesday, 27th June, 1900.

General Sir GEORGE W. A. HIGGINSON, K.C.B., Colonel Worcestershire
Regiment, in the Chair.

THE CHAIRMAN :—In the unavoidable absence of Major-General Sir J. F. Maurice, at the very shortest notice, having come in like one of yourselves to listen to what I have no doubt will be a most valuable paper, I was invited to take the Chair until either Sir Frederick Maurice was able to come himself or Sir James Fergusson could arrive. I should have a great deal of hesitation in taking the Chair under ordinary circumstances, but for the great pleasure it gives me of renewing relations with an old and tried friend, Dr. Warre, Head Master of Eton. His name is so familiar to all of you, not only as head of the greatest school in England, but also as having encouraged all those manly habits of athletics which have such vast influence upon the characters of those who are students at our Public Schools, that I feel sure that any words that come from him will meet, not only before an audience like this, but before the country at large, that close attention which the subject itself demands. The advice of one who is so intimately acquainted with the habits of our youth, and those who will succeed us in the different and varied professions to which Eton men devote themselves, will be of the greatest possible value to the country. I have no desire to detain you further than to ask you to listen with attention to the paper which Dr. Warre, the Head Master of Eton, will now read.

LECTURE.

THERE is an old saying, "*Salus populi suprema lex.*" The principle which it embodies has been held to justify sudden resolves and trenchant measures at critical moments in national history. But surely it is also deserving of wider and more deliberate application. For a people, free, and capable of interpreting the lessons of any crisis through which it is passing, the proverb has a very pregnant and cogent meaning.

A nation such as ours, nurtured in freedom, and habituated to discussion, ought to be able in the presence of a trial such as that of which we have had experience during the last eight months, to rouse itself to the supreme efforts necessary for its own safety, to recognise the dangers and the weaknesses which have beset it, and, while there is time, to set its house in order, so as to be able to meet with cheerfulness and readiness the perils, which may at any moment threaten our welfare, not to say our very existence, as a nation.

The lessons of the warfare in which we have been engaged, the lessons to be drawn from the outspoken antipathy of the populations of Europe, are, one would think, sufficiently grave. We have borne our disasters with dignity and undaunted courage, we have not paled before the animosity exhibited against us. But there is great reason to fear that in the hour of success the warnings which we have had may be unheeded; reason to fear lest in the sequel we may become all too well satisfied with ourselves, all too full of confidence, and withal ready to sink back into an easy-going, do-nothing apathy, and so, when the next crisis occurs, may be found all unprepared. Does not past experience justify the apprehension that the coil and clutch of re-action will strangle any attempt to set upon a sound basis our system of national defence—any attempt on the part of those who desire to effect necessary changes in our methods—any attempt to secure a provident organisation of the forces, which we, as a free nation, if we were only wise in time, might have at our disposal?

Moreover, apathy and re-action are not the only influences that we have to dread. Against any effort to create in the national body a healthy condition as regards national defence, we must expect to find arrayed the microbes that infest our national life—multitudinous “-isms,” some of them mere bogies, such as the political cry of militarism; some of them deep-seated and much more dangerous, such as departmentalism; their name is legion—I should not like to attempt to count them; they are innumerable. But they are there, and will have to be reckoned with. It is true that the strong actinic force of enlightened popular opinion will, if it can only be brought to bear upon them, deaden their activity, and destroy their power of doing mischief. A healthy popular energy has ere now triumphed over them. The history of the Volunteer Force in this country will illustrate what I mean. Still the great danger is “Lest we forget!” Falstaff’s “malady of not marking” is one which too easily besets us.

The lessons of the past campaign are many and various. Shall we really lay any of them to heart?

Students of the history of tactics know that with every distinct improvement of weapon there must come a change of tactics. Will the dearly-bought experience of what smokeless powder and long-range rifle and artillery fire can do leave us satisfied with our present system of drill and manœuvre? Shall we be content with a merely empirical patchwork upon our present red books? Or shall we set ourselves to make the best of our experience by remodelling our system of drill and manœuvre upon a really scientific basis? Am I wrong in thinking that the forces of educa-

tion might be of some use to us in these matters? That the Q.E.D. of the one is not so alien to the Q.E.F. of the other as some would think? That a wider diffusion of the knowledge of the *elementa* of military science among the educated youth of the nation would tend not only to raise the standard of military knowledge in the Army and Auxiliary Forces, but to improve the methods of communicating that knowledge to the rising generation? Am I wrong in thinking that by the diffusion of this knowledge we may also widen the area from which officers may be obtained, and possibly tap a perennial source from which a supply of well-educated officers may be constantly drawn?

Among the gravest of the lessons which the war in South Africa has taught us is that of the constant drain upon our resources, in respect of officers, which this warfare has entailed, and, I fear, it must be added, all warfare in the future will entail.

Let me state briefly the facts so far as I have been able to gather them from official sources.

Casualties among officers in South Africa to 12th June, 1900:—

Killed	-	-	-	-	-	285
Died of disease	-	-	-	-	-	92
Wounded	-	-	-	-	-	770

1,147

Percentage of casualties among officers as compared with that of men:—

2 to 0·7, or as 20 to 7.

This return does not take into account the prisoners and missing.

It covers the result of only eight months' warfare. But beside the army in the field, in which, as we see from this return, the drain and waste of warfare make themselves so soon and so terribly felt, we have the Auxiliary Forces, which are, or at least ought to be, an efficient and integral portion of our national defence.

The returns for these on 1st January of the present year are as follows:—

1. The Militia	-	-	total establishment	129,800
			Officers	3,548
2. The Yeomanry	-	-	total establishment	11,870
			Officers	705
3. The Volunteers	-	-	total establishment	263,416
			Officers	9,866

Of these, the Yeomanry, as regards officers, had at that date nearly their full number. But the condition of things in the Militia and Volunteers was not so satisfactory. Roughly speaking, they were short of officers by about 10 per cent. In other words, we wanted nearly 1,400 more officers to bring them up to their proper establishment.

It must also be noted that commissions in the Militia are, in a large number of instances, held merely as stepping-stones to commissions in the Regular Army, so that the Militia is in this respect at a disadvantage; and, if these birds of passage were deducted, the Militia would show a still greater deficiency in officers than it does at present.

If the Militia is intended to be an efficient force, this plan of passing officers into the Regular Army through it does not seem to be a sound one. At any rate, if these officers must go through the Militia, they should be regarded as supernumerary.

In the case of the Volunteers the difficulty in getting officers is, perhaps, even greater. But it lies chiefly in the region of expense, and in the traditional treatment of the Volunteer Force by the authorities. Possibly this may undergo some alterations as a result of the present crisis.

The facts that I have cited speak for themselves. They should open our eyes to the weakness which is thus revealed, a weakness which may become a source of danger if it be not remedied.

Is there no remedy? It may be thought presumptuous on the part of any individual to suggest one, but the gravity of the situation is such as to make it a duty on the part of those who have had any special opportunities of acquiring knowledge, and of observing facts that bear upon this subject, to speak out and say what they believe to be true, and likely to be of use in the organisation of national defence, which we believe it to be the imperative duty of the Government to undertake.

I have ventured to speak here to-day as one of those who in the year 1859 was deeply stirred with the sense of the necessity of creating a national force for defence by the enrolment of Volunteers; as having taken part in the foundation of the N.R.A.; of the University Rifle Corps at Oxford; and again of the School Rifle Volunteer Corps at Eton. As a master at a Public School for more than forty years I have seen what boys in a Public School Corps can learn, and can be, and can do, as Volunteers. I have been keen to note all along the effect upon the character of the boys, who have been members of the Corps, of the instruction and the discipline thus imparted to them.

I can honestly say that I have never seen any of those effects produced which the bogey of militarism would fain have us think to be the natural results of such training.

I have never seen any even of the keenest Volunteers made worse scholars, or worse boys, by submitting to the instruction and the discipline of the Corps.

I believe, on the contrary, that all boys who go through that discipline and instruction are the better for it, gaining by it an increase in the power of self-control, and still further in the power of being useful to their country in their after life.

On the other hand, I believe that the salvation of the country as regards national defence depends upon the right and timely training of its youth with reference to this special national need. The saying of the Psalmist contains for the nation in our days, as it did for the Oriental sheikh in his own, a profound truth: "As the arrows in the hand of a mighty man, even so are the children of youth. Happy is the man that hath his quiver full of them. They shall not be ashamed when they speak with their enemies in the gate."

And so I wish well to Lord Meath and his efforts for the promotion of drill in schools and the formation of cadet corps. How he has laboured

to this end, and how his proposals have been met, we know from the published correspondence. But the point which I wish to urge, though in harmony with his contention, is somewhat different. It lies in a different plane.

Being anxious with regard to the supply of officers, and feeling that in the Public Schools of England there is an ample and suitable source of supply for the needs of the nation, I ventured, in the desire to discover how far my view had the sympathy of my own profession, to approach the Committee of the Head Masters' Conference upon the subject.

The Conference of Head Masters is a body which embraces no less than 102 of the principal Public Schools. The conditions of belonging to this Conference are that the Governing Body of the School should be a public body, that the School should have not less than 100 present scholars, and not less than 10 of its past scholars resident undergraduates at the Universities of Oxford or Cambridge.

In consequence of the question thus submitted to the Committee, the following inquiry was circulated among the members of the Head Masters' Conference :—

“At a meeting of the Committee of the Head Masters' Conference on Thursday, 15th February, 1900, the following resolution referring to the above subject was passed, *nem. con.* :—

“As a step in the organisation of national defence, it is desirable that all persons *in statu pupillari* at the Universities and Public Secondary Schools, above 15 years of age, and capable of bearing arms, should be enrolled for the purpose of instruction in drill, manœuvre, and the use of arms.”

“The Committee feel that at the present season, when the question of national defence is one that awakes anxiety in the public mind, and at no distant date must be dealt with in a comprehensive manner by the Government, it is desirable that the youth of the country, and especially that part of it which is receiving a liberal education, belonging as it does to the class from which officers for the Army and the Auxiliary Forces are mostly drawn, should have such a part in the scheme of national defence as may most easily, and most profitably for the nation, be allotted to it.

“It is not necessary at present to enter into details of the scheme, which will require, and is certain to have, much consideration and discussion, but the affirmation at the present moment of the principle involved in the resolution of the Committee would at least do something towards inviting the Government to consider the matter in relation to the scheme of national defence which they are bound to take in hand.

“The Committee therefore would be glad to hear from the members of the Conference severally the expression of their opinion, whether agreeing with, or dissenting from, the principle involved in the resolution.”

From the answers received there could be no doubt as to the feeling which Head Masters entertained generally as to the desirability of some measure being adopted by the Government with a view to the organisation of Public School Corps. Out of the 102, no less than 83 replied with a direct affirmative.

After this I was emboldened to approach the authorities at the War Office, where my proposals were very kindly and courteously received, and I was asked to put them in the form of a memorandum, exhibiting a scheme in some detail which might form the basis of consideration.

The following memorandum was drawn up, and submitted to the Secretary of State for War :—

I. At the present time, there is a golden opportunity for placing on a permanent footing, for the purposes of national defence, the training of a large portion of the educated youth of the country.

II. It is not advisable for this purpose to deal with boys under the age of fifteen. To begin military drill with boys before that age can do but little good to them, and will only make them, in too many cases, dislike the idea of military service of any kind. At the age of fifteen a boy, generally speaking, is becoming old enough to understand the call of patriotism, and is ambitious to join that in which the older boys are taking part.

III. In the Tudor times all the youth of the country were called upon by law to learn the use of the national weapon. Hence the familiar names that have come down to us, "The Shooting Fields" at Eton, and "The Butts" at Harrow and elsewhere.

IV. And now what is wanted in the first place for the organisation of this large and important body of the youth of the country is a short Act of Parliament. If left to voluntary effort, the results which are desired will not be obtained. Anyone who reflects how soon a wholesome sentiment, such as that which has now been roused with regard to national defence, defervesces when the danger has faded out of sight, will admit that it is of the first importance to give such a movement stability and permanence.

V. To effect this an Act of Parliament is needed. The tenor of such Act should be "That all persons *in statu pupillari* in Public Secondary Schools, above the age of fifteen, able and willing to bear arms, should be enrolled, for the purpose of instruction in drill, manœuvre, and the use of arms."

VI. :—

1. The enrolment in Public Secondary Schools would take place at the beginning of the term following that in which each boy reached the age of fifteen.
2. Head Masters would be requested to furnish a list of such boys at the beginning of each term for the information of the officer commanding regimental district.
3. The formula of enrolment should be such as appealed to the boys' patriotism and sense of duty in serving Her Majesty for the purpose of national defence.
4. Each boy, on being enrolled, should be given a duplicate of the formula of enrolment to keep.

5. The terms of enrolment for instruction in drill, manœuvre, and the use of arms, should follow the lines of the Volunteer Act as regards number of drills required of recruits and of efficient, but should include provision for further instruction for Certificates of Efficiency and Certificates of Proficiency as hereinafter described.

VII. Organisation for administrative purposes might follow, as nearly as possible, the territorial lines. At the same time, it is evidently desirable that the University and School Corps should not be included in the distribution of Brigades for the defence of the country, but the whole of the force thus enrolled should be treated as separate bodies, which might be called Instructional Corps, or Corps for Military Instruction. These Corps should be organised for the whole of England and Scotland, and have an A.A.G. at the War Office, charged with the general supervision of the whole.

VIII. :—

1. It should be the aim and object of the instruction given, not so much to qualify the boys who receive it to take their place in the ranks as privates (though in the first instance they must of course do this), as to communicate gradually with the practice of drill, manœuvre, and the use of arms, the knowledge, theoretical as well as practical, the possession of which will help to qualify them for commissions as officers, whether in the Regular or Auxiliary Forces of the realm.
2. If this is carried out under an intelligent method, it will be found that, so far from interfering with the education of the youth of the country, the knowledge and habits thus acquired will be a very valuable addition to their education.
3. Supposing the average time that a boy would be in the School Corps to be three to four years (fifteen to eighteen or nineteen), the course of instruction might follow these lines:—

1st. year.	{ Recruit Drill. Simple Tactics.	{ Musketry. Theory of Projectiles (Elementary).
2nd year.	{ Drill. Tactics. Entrenchments. Elementary Surveying.	{ Musketry. Theory of Projectiles. Scouting. Reports.
3rd and 4th years.	{ Manœuvres : a. Tactics of the three Arms. β. Elements of Strategy.	{ Musketry. Theory of Projectiles and Explosives. Range-finding.

The second year, work for Certificate of Efficiency.

The third year, work for Certificate of Proficiency. This extra work, voluntary.

If a fourth year is available, the studies and practice of the third can be continued and extended with advantage.

4. Certificates. *a.* To obtain a Certificate of Efficiency it would be necessary to pass satisfactorily the examination now required in the Volunteer Service for promotion to the rank of sergeant.
- β.* To obtain a Certificate of Proficiency would require a competent knowledge of the subjects (with some exceptions) now included in the A and B Examination of Subaltern Officers in the Army.

IX. Uniform should not necessarily be required, at any rate in the case of the smaller schools. But where there were a readiness and a desire to provide it, it should be under regulation, and be all of the same simple pattern: a loose grey patrol jacket with shoulder straps, which would bear the designation of the corps, knickerbockers or loose trousers, and puttees or gaiters—clothing such as might be generally worn and be of use in private life.

A field service cap or slouch hat would be a suitable head-gear.

X. The Government would provide besides the District Instructional Staff:—

1. Sergeant instructors.
2. Arms and ammunition.
3. Ranges.
4. Capitation grant for those above seventeen years of age, as now.
5. Capitation grant for (*a*) Certificates of Efficiency.
(*β*) Certificates of Proficiency.

XI. If in the Public Secondary Schools, instruction of the kind indicated above, which embraced theory as well as practice, the science as well as the art, was given during the years of a boy's life, from fifteen to eighteen or nineteen, a still higher standard of knowledge, theoretical and practical, might be aimed at and attained at the Universities.

XII. It seems almost needless to insist upon the obvious advantage to the country in having a large percentage of educated young men thus conversant with military science.

The effect upon the education of officers in the Army would gradually be felt, and tend to raise it to a higher level.

The country would have for its Army and Auxiliary Forces a living and perennial source from which to derive its officers in the future.

Such was the scheme as sketched in the first instance. I feel that it is merely in embryo and requires consideration and discussion. But there are principles involved in the details given which should, I think, be maintained, even though the details of arrangement themselves be varied.

First, it should be recognised that unless established by a special Act of Parliament, or embodied in some general Act dealing with the organisation of national defence, the permanence, the stability of any such scheme, whereby the educated youth of the country can become available in the future for the purposes of national defence, cannot be ensured.

Secondly, I would notice an alteration in the memorandum, which in the first draft, following the resolution accepted by the Committee of the Head Masters' Conference, expressed the desire that all persons *in statu pupillari* capable of bearing arms should be enrolled, etc. It was pointed out to me from various quarters that the compulsion thus implied would raise great opposition, especially as it seemed to be the insertion of the thin end of the wedge for conscription, which we do not desire.

Consequently in the later draft of the memorandum the words "capable of bearing arms" were altered to "able and willing to bear arms," thus maintaining the voluntary principle which at present is the basis of all our military service, whether in the Regular or in the Auxiliary Forces.

I believe that, as far as the Public Schools are concerned, the numbers that will take the patriotic view of their duty towards the defence of their country will not fall far short of those who are capable of bearing arms, and it is certainly better to maintain the voluntary principle until necessity compels us to conscription.

Thirdly, a question will arise whether Instructional Corps, such as indicated in the memorandum, should be treated as part of the territorial system, or organised upon a separate basis. If the object of the institution of these corps is to form a nursery for future officers, it would seem wiser to place them on a special footing. Already, as I am very glad to learn, it has been conceded to the University of Cambridge that its Volunteer Corps should be dissociated from the Brigade system, and recognised as having a special function of an educational character. It is but a step from the Universities to the Public Schools, which feed them in the main with students, and I trust that that which is conceded to University Corps may also be extended to Public School Corps.

But without doubt the most important, as it is the most interesting, question raised by any scheme which thus brings the Public Schools into definite relation with the organisation of national defence is that which concerns education. Given the formation of these Instructional Corps:—

1. What do you propose to teach them?
2. How far will the instruction in military subjects interfere with the ordinary curriculum of the Public School?

I should take it that a boy enrolled at 15 would have on an average three years in his School Corps, possibly four, if he stayed on at school till he was 19 *æt*.

The Public School Corps already established conform, I believe, to the Volunteer Regulations as regards recruits. Each recruit has to fulfil 60 drills, besides musketry, in the first two years. As a matter of fact, most boys in the Volunteer Corps do more, and the musketry as well. I should not wish to increase the number of hours devoted to military instruction beyond those which in the best Public School Corps are now given.

But I confess that I should like to see the method of instruction somewhat altered, and improved.

It is desirable, no doubt, that every Public School boy should be able to take his place in the ranks, if required; should know how to move at the word of command, and should be able to handle a rifle and shoot with accuracy.

But we are aiming at something more than this. We wish to be able to draw from the educated youth of our country a free supply of men qualified to hold commissions as officers; men not only of cultivated intelligence, but also from their boyhood imbued with the first principles of military knowledge; which knowledge, up to a certain point, should be, I contend, common knowledge, the knowledge of us all.

If, looking at the needs of the nation, at the possible demands which may come upon it in the future, we agree that this is desirable, then patriotism requires that we should see how it can be accomplished with the least detriment to education; nay, I would rather say, with the greatest benefit to education, and to the greatest advantage of the nation.

And, first, as regards the Schools. The result of the Act of Parliament desired in the memorandum would be the enrolment of some, say, 10,000 boys throughout the country in the Public School Corps, which would be, under the Act, Instructional Corps. The boy would become a member of his Corps at 15 *æt.*, and, in accordance with the present rule, would do not less than 60 drills in his first two years, probably more, if the usage of the School Corps in some places were maintained.

But I should hope that, in addition to the mere drill on the square, or in place of some of it, the principle, which should be observed from the first, and throughout, would make itself felt, *viz.*, that for everything the boy *did* in the way of drill the *reason* of it should also be taught him, and that he should be made to understand the why and the wherefore of each part both of drill and of musketry, which two would form the subjects of his instruction in his first year.

And here I feel compelled to say that I should like to see a great revolution in our military text-books. I should like to see written by able military men, in conjunction with educational experts, first of all, four Primers of Military Knowledge:—

1. The Primer of Tactics.
2. The Primer of Musketry.
3. The Primer of Military Topography.
4. The Primer of Military Engineering.

These four, if properly written, free from pedantry, and not overburdened with useless details, would, so far as military subjects are concerned, contain all that was essential for the young officer to have learnt by the time that he got his commission, and, I hope, nothing that he would have to unlearn.

They would contain the Q.E.D. as well as the Q.E.F., and be not merely empirical compilations, but really scientific works; not of the dry-as-dust type, but stimulants of that living energy with which the consciousness of knowledge translated into action, and the delight of action based upon knowledge, inspires the young.

For the instruction which should be contained in these books I feel sure that the Schools would, in the course of the three years which the boy would have for them, find ample time and opportunity.

They would be able to do more. There is no doubt that, if it is felt that it is for the good of the nation, that boys during their time at a Public School should gain a certain familiarity with problems that present themselves in the military text-books to the young officer, the mathematical and science and history classes at the Public Schools can do a great deal in their own way to make the problems of tactics and strategy, of military topography and engineering, and of the scientific side of musketry, to be much more matters of common knowledge than they are at present.

Once the need of this, from a patriotic point of view, is demonstrated, and I feel sure that the Schoolmaster will not be found wanting in doing his best to meet the requirements of the nation. And so far from acting badly, or to the detriment of education, I believe with all my heart that our education will be improved by being thus inspired with a patriotic spirit. I would have each lad, when enrolled, given a duplicate of his enrolment paper to keep, whereon should be inscribed words—familiar as household words, but still of the nature of a *sacramentum*—telling of a duty towards his Queen and country, and consecrating for him and for his teachers the time given, and the labour expended, in the free and willing service of our common mother.

But beyond the ordinary course through which all members of the Instructional Corps should pass, provision should be made, by which those who wished to make the Army their profession, should be able to obtain promotion in their Corps, and some claim for recognition as candidates for commissions hereafter. I would have instituted for this purpose Certificates of two classes, called—

a. Certificates of Efficiency.

β. Certificates of Proficiency.

Certificates of Efficiency should be required for promotion to the rank of sergeant, and should include the subjects now required, but so modified as to give greater value to sound theoretical knowledge, while at the same time demanding all that is necessary on the purely technical side, such as the power of communicating drill and instruction, in fact, all the practical knowledge which a N.C.O. ought to have. These Certificates should be open to members of the Corps after completing their course of sixty drills, and so might be attainable at the end of the second year's training by those who qualified for them.

The Certificates of Proficiency should be open to the holders of the Certificates of Efficiency and should attain to a higher level in tactics, topography, and engineering. For these, I have no doubt that it would be possible to provide special classes in connection with the Army classes at the Public Schools. Such classes would, no doubt, be mainly composed of those who intended to make the Army their profession, but still there would be many who would avail themselves of them, and so be able afterwards to do good work in their own counties and districts for the Militia, Yeomanry, and Volunteers.

I cannot help thinking that if the Instructional Corps were thus constituted in the Public Schools, there could also be at the Universities

(as, indeed, there is at present manifest in the University of Cambridge) a desire to be helpful, and to bring to bear upon military knowledge the great benefit of their scientific enlightenment and equipment. Indeed, the Universities can be, if they will, as useful as they are patriotic in this respect.

Perhaps some will think that I am wandering into Utopia, but I would ask your forgiveness if I dare to set before you my dream of the future of military education in the Army as affected by such a change in the relation of the Public Schools and Universities to National Defence as I have indicated. I dream of a time when the scientific side of the military profession, as represented at Woolwich and Chatham, shall be drawn into closer relations with the Universities, and find, in their association with them on their scientific side, great advantages, greater breadth, greater depth, and greater freedom in the knowledge of the things that concern their profession.

I dream of a time when Sandhurst as now constituted shall be no more, but have passed away, being in its present form both a waste of money and a waste of time; when it shall have been changed, and arisen again with higher powers and higher functions, and become what it ought to be, not a mere preparatory school for the Army, but a Military University, in which every officer of the Army will in due course take his degree, and those that gain honours will also gain the advancement and the emoluments that ought to accompany them. I dream of the day when the present system, by which a man has to cram in order to get into the Staff College, will have come to be thought monstrous and unnatural.

But then, before this can come about, I feel that the system of obtaining commissions must be somewhat altered. I would still keep up the competitive examination for the Army. But I would send the successful candidates straight to their regiments.

In these they would go through a course of instruction as Second Lieutenants, to qualify them for promotion to be Lieutenants. For their use might well be written:—

1. A Primer of Military Law.
2. A Primer of Military Organisation.

They would continue, on a higher level, their studies in Tactics, Topography, and Engineering, and would have to pass an examination, theoretical as well as practical, upon all these subjects before promotion.

As for those who wish to pass to a commission in the Regular Army through the Auxiliary Forces, I should demand from them, first, a certain educational guarantee, in the shape of a certificate of having passed Responsions at Oxford, or the Previous Examination at Cambridge, or any equivalent examination at any other University, or an equivalent examination by the Civil Service Commissioners, or the Oxford and Cambridge Certificate at the Public Schools, or any examination that might be determined to rank with these. I would also demand:—

- a. Certificate of Efficiency, and
- β. Certificate of Proficiency,

and two trainings, in which they would have added the study of Military Law and Military Organisation to that of the subjects contained in the first four Primers.

But I would not allow these birds of passage, as I said before, to count as permanent officers of the Auxiliary Forces.

Further, I would encourage in every way the employment in the Auxiliary Forces of all young men holding Certificates of Efficiency and Proficiency who did not intend to take commissions in the Regular Army. Lists of the persons holding these Certificates, and the districts in which they reside, should be kept at head-quarters, and they should be invited to join the Militia, Yeomanry, or Volunteers of their own districts, and to keep up the military knowledge which they have got.

I know that the fear of expense is a great bugbear, and prevents many from joining the Auxiliary Forces who would otherwise do so. But if, as the outcome of this war, our military institutions are overhauled, I trust that something may be done with regard to the Militia, Yeomanry, and Volunteers which may make them more attractive as well as less expensive to young men and increase their usefulness to the country.

I should have liked, if time allowed, and if I dared, to say something further of the effect that the adoption of this scheme would have upon military education in the Army. But I have tried your patience too long, and will conclude now by thanking you for so kindly hearing me thus far.

Major A. F. HOARE, 1st V.B. Bedfordshire Regiment (Haileybury College) :—I was asked to come here by officers commanding Cadet Corps in other schools, Clifton and Marlborough, Wellington and Cheltenham, who are not able themselves to come to-day. I myself have been connected with the Cadet Corps at Haileybury for 13 years. We wish to give our support to Dr. Warre's scheme. We wish collectively, on this and on every occasion, to thank the Eton Corps, and Dr. Warre especially, for the lead they and he have taken in all matters connected with Public School Volunteers. Taking it on the whole, we believe in this scheme, but I am afraid that one always tends to run into criticism, and my remarks will rather be directed to that than to repeating what Dr. Warre has said. I hope that he and you will excuse me for so doing, and also for, to some extent, going into detail giving our experience in other schools. The first point in this scheme is that it severs for us the connection with our local battalion. With regard to the Eton Corps, I believe it is true they have practically no connection with any other battalion—while all other school corps are more or less closely connected with a Volunteer battalion—and that separation from the battalions to which we are attached involves certain disadvantages which the Eton Corps cannot feel, and in what I am going to say I shall mention some of the advantages we shall lose. The most important part of the training for the Volunteer corps appears to me to be musketry. Rifle-shooting can be taught to the young, and I imagine, like cricket and football, the young can learn it more easily than those older. The condition of affairs in the schools now is unsatisfactory, from the extraordinarily small number who get musketry training. Many of the larger schools have corps numbering 150 to 200, and how many of those are receiving musketry training? In 1897 statistics were collected from twenty-nine leading Public Schools—out of 4,075 Volunteers about 400 were shooting with fair regularity in the summer, a considerably smaller number at other times in the year. That is a point that requires a great deal of attention. Why is it that there are so few?

Mainly because the ranges are at a great distance. There are about three schools which have a range at their door, Charterhouse, Rossall, Bradfield. In other cases to get shooting lasting half an hour, the boys have to spend three or four hours; Haileybury boys often have to travel from Haileybury to Staines, that is a three hours' journey each way. Others are not so badly off as that. Another point in regard to this is that even if the range is at their doors, the boys must sacrifice time which would otherwise be devoted to their games if they are to learn to be rifle shots. If in the future the whole school corps is to be taught to shoot, the amount of time required for their training would be very large, and the masters, or the instructors of musketry, whoever they might be, would have to devote many hours each week to the purpose. The boys, also, if they are to become fair rifle shots and reach a higher standard of military knowledge than at present, must devote more of their time to this object. With regard to musketry, there might be a loss for schools from severing their connection with the local battalion. At present many schools have free use of the range belonging to their battalion, or can hire it for a nominal rent. Such an arrangement they could hardly expect to continue if they had no official connection with the battalion. The next point I would speak about is the instruction that is to be given. Dr. Warre has sketched a scheme of Public Schools improving the military education of the Army. Well, I have too much respect for the military knowledge and the professional knowledge of soldiers to think that Public Schools, boys, or masters, are ever going to do that. My feeling about it is, that what the masters in charge of these corps have to do is to learn everything they can from the professional soldier, and not the other way round. Now, in any scheme at all the teaching must mainly come from the masters. We cannot expect the visiting instructing staff to appear at the schools very frequently. They can give the spirit, but the main work must be done every week by the masters in charge of the corps; and in that respect we shall lose something by losing connection with our local battalions. We shall lose the visit of the adjutant. The adjutant is a soldier, and in nearly every case we can learn something from him. Those visits are valuable as giving a military spirit to us. Also the visits from the officers of the battalion will be lost. It is valuable to us, as masters and Volunteer officers, to see something of some other military body, even if it is only Volunteers. To be cut off from everything, and see nothing from year's end to year's end except school corps, would not be instructive. Another point is, I am sure, important. Officers of the Volunteers are now allowed certain opportunities of learning soldiering with Regulars. They can attend schools of instruction, and they can be attached to Regular forces, and very rarely they can get certain allowances (nearly amounting to pay), and can gain extra grants for their corps by passing examinations. These allowances and grants are a real encouragement to them to learn their work. The honorary officers of school corps can only obtain this training at their own expense. They get no allowance of any sort. The officers of these corps should be allowed substantive rank, and every privilege in learning their work which other Volunteer officers have. For the future improvement of the Cadet Corps, the great thing is the future improved military training and knowledge of those who are instructing the boys. A great many of us, masters and boys, who are connected with these corps, devote a great deal of time to the work in the course of a week. For instance, on five evenings of last week one officer attended drills, or manœuvre, or class of instruction of the Cadet Corps. If the instruction is to be made so much more than it is now—and, as an officer connected with a corps, I feel most strongly that it ought to be—it will make still greater demands on our time and energy. More officers will have to be appointed from the Public School staff, and more time will have to be devoted by the boys to it. Dr. Warre proposes a change in the character of the teaching, namely, that instead of, or as well as, drill, we should teach everybody the reason of everything, a thing which we have not entirely neglected, but which

demands far more time and trouble than mere drill. In drilling, you can drill the whole battalion of 200 men with very few officers looking after them ; but if you are going to take out bodies of boys and teach them how to work a patrol, or to write a report, or to stand as sentry, you cannot take out 200, and you have to go out with small bodies of 10 or 12 in each class, as you may call it, for this work. That will make much greater demands on boys' time, and still more on the time of the masters. In the present year, 1900, many believe that the time ought to be given, and it is certain that it can be given if the Head Masters of England wish it, and will consider their assistants. Lastly, there is one protest I wish to make, and that is against the abolition for us of the Queen's uniform. Boys, and men too, are imaginative, and many of us have had experience of wearing a uniform which is not the Queen's uniform, except by special permission granted to a Volunteer battalion. There can be no doubt of the moral effect on corps of being allowed to wear the Queen's uniform. The history in that respect has been rather interesting. Every corps and every Volunteer company began with fancy uniforms, and the more they were remote from that of the Regular Army, the better pleased was the Volunteer, because he apparently thought he had introduced an improvement which the Army might copy.

A MEMBER :—I do not understand that Dr. Warre is prohibiting the uniform at all.

Major HOARE :—The uniform has become, in almost every Volunteer corps, the nearest approach to that of the Regular Army that is permitted. The number of corps that are now left in what I should speak of as fancy uniform may almost be counted on one's fingers ; and even in those one may notice an extraordinary change to the pattern of the Regular Army. Instead of a loose blouse hanging in every direction, they have a tunic ; and, instead of a hat of their own pattern, they have the Army pattern head-dress. And so I beg that we may be allowed to retain the uniform the Volunteers are now allowed to have, and only adopt a Norfolk shirt and gaiters when that is adopted as the Army uniform, or is worn, say, by the cadets at Sandhurst. To recapitulate shortly—to bring about any great improvement in results obtained by the Cadet Corps of our Public Schools, three main conditions are necessary, all of which are attainable. First and most important, the higher military training and knowledge of the instructors, *i.e.*, the masters who are the officers of the corps, especially in the knowledge of discipline, that can only be learned by contact with Regular troops. Second, that masters and boys should devote more time to military work, and especially to musketry, and that school arrangements should be modified to render this possible. Third, that a range (in most cases, no doubt, a safety range) should be made within half a mile of the school—if possible, closer.

Colonel the Earl BROWNLOW, A.D.C. (Commanding Home Counties Volunteer Brigade) :—As one of the original members of that corps in which Dr. Warre is so deeply interested, the Eton Volunteers, I trust you will allow me to take up a few minutes of your time. If you will allow me, I should, first of all, be glad to give you in a very few words a little of my personal experience in the matter. The Eton Corps was instituted the last half that I was at Eton. We were drilled by the best drill sergeants in the world, the drill sergeants of the Grenadier Guards, and, if I remember aright, Sir George Higginson was at that time in command at Windsor, but I am not quite certain of that. The result was that I learnt my drill thoroughly while in the ranks at Eton. A year after I left, I joined the Grenadier Guards, and I found that when I went to drill in the barrack yard, instead of being entirely at sea, I knew my drill fairly well already. I can only say that this gave me an advantage and a confidence which I never lost the whole time I was in the Army, and if we at that time had had the advantage of the further instruction which Dr. Warre now proposes by his scheme, I believe it would have been an immense blessing to everyone who went into the Army after passing through the Volunteers. But I believe if I had not gone into the

Army, but only into the Volunteers, that training would have been of even more value to me. Of course, I got a thorough training in the Grenadier Guards, and I should have had it whether I had been at Eton or not, but if I had not gone into the Guards, I should still have had a thoroughly good training by thoroughly good sergeant instructors. I believe that such corps as the Eton Corps are of enormous value, both to officers who wish to go into the Army, and officers who will go afterwards into the Militia, the Yeomanry, and the Volunteers; and, therefore, I think they are worthy of the best consideration of the War Office. Now, with regard to the scheme itself, there is only one point in the scheme which I wish to touch upon, and that is the question of compulsion. I understand from the lecture delivered by Dr. Warre, that the Committee of Public School Masters were themselves of opinion that military education should be compulsory, but that afterwards they altered the terms of the memorandum. It began by saying "all who are capable of bearing arms," and was altered to "all who are able and willing to bear arms." I cannot help regretting that this alteration should have been made. I cannot understand why, when a boy is *in statu pupillari*, he should be asked whether he wishes to have a certain military education or not. With the other things at school—it used to be so in my time, and is so still—we were not asked whether we wished to learn Latin and Greek, but we all had to learn it, under a system of compulsion which I have no doubt Dr. Warre is perfectly familiar with. Therefore, I do not think it ought to be left to the boy to say whether he would have a military education or not. I think that military education should be compulsory. But the liability to serve is quite a different thing, and that, I think, ought to be voluntary. There is no reason that I can see why the older boys should not be enrolled and be made liable for service, of course, with the consent of their parents and guardians, and under those circumstances it appears to me that the objections that the War Office have to giving them a capitation grant would then be removed, and they would receive their capitation grant in the same manner as any other Volunteers. There is one very strong reason I have for objecting to the removal of compulsion. I hold very strongly indeed, with Lord Meath, whose name has been already mentioned by Dr. Warre, that every boy in every school, not only in secondary schools, but in primary schools, should be given a certain military education. Now, it might be easy at Eton and Harrow, and our great schools, to give a voluntary military education, but I cannot see myself how it is likely to be carried out in the smaller primary schools. It appears to me in the small primary school that the education must be compulsory, and if it is compulsory in those schools, it would be considered a grievance if it was made compulsory in the primary schools and in secondary schools it was left to be voluntary. It would be looked upon as a class difference, and would be very unpopular in the country. Therefore, I can only say I trust and hope that that question will in future be reconsidered, and that military education will be made compulsory, but the liability to serve should not be compulsory. It seems to me that the duty of the secondary schools is to educate that class who will in the future be the officers of our Army and Auxiliary Forces, while the duty of the primary schools should be to give a military education to the men who will have to serve under them. I will say nothing more about the scheme, but I can only say that in future if a Bill is brought into Parliament embodying a scheme for Cadet Corps and for military education in schools, I should be only too glad, in my place in the House of Lords, if it should come there, to give it a most cordial and active support, and I trust that Dr. Warre will have every success in passing it through Parliament. That is the only point on which I wish to touch, and I will not take up more of your time.

Captain W. H. JAMES, *p.s.c.* (late R.E.):—It would be impossible to criticise in detail the many excellent propositions that Dr. Warre has brought before us this afternoon, but I think we may all agree in saying this, that the scheme he has put forward is on the whole the first really complete one that has ever been brought

before the public for the instruction of the college boy at a Public School in military knowledge, and as such I think it deserves the support of everyone who believes that from such military education great good is to be derived for the country. It is not merely a question of teaching boys drill. Drill, after all, is a small part of military training, it is training as distinguished from drill which should be given to the boys, and that I believe may follow the lines which Dr. Warre suggests. That is, as we know, from what Major Hoare has said, and others who have written and spoken on the subject have said, a very difficult system to introduce into a Public School. It is a question of time. It is not sufficient to devise a series of text-books for giving the instruction; it is not even sufficient to see that the masters who have to give the instruction know what they have to teach; it is necessary to find the time, either out of the boy's work time or his play time, and that I think is the great difficulty any such scheme would suffer under. I believe, at present, the nation is in what may be described as the hot fit. It is eminently probable that in another few months we shall be in the cold fit, and, therefore, I think we are much indebted to Dr. Warre for emphasising the need while the hot fit is on, urging us to take occasion by the hand and see if we can do anything to aid the general military instruction which is so necessary for the safety of the nation. First and foremost, I agree with Major Hoare, that we should begin with the drill-books. The drill-books are remarkable survivals of the unfit. We have in the Infantry Drill a series of movements excellently adapted for the age of the slow step, but distinctly out of place with the modern long-range smokeless rifle, and the high-explosive shell fired by artillery. Looking through the Infantry Drill, I come across the slow and solemn echelon movement, which is about as useful as teaching an infantry soldier the use of the hand grenade. The same remarks apply to the other two drill-books. It is laid down solemnly in the Artillery Drill-book that guns should have a dark background, but anybody who has seen a smokeless gun fired knows the proper thing to have is a light background. This is only a small detail, but there are other similar things. The instructions both for infantry and cavalry are badly in want of revision. But, as I say, these are minor details, and have little to do with the subject under discussion. I thoroughly support Dr. Warre's scheme for obtaining officers for the Army. I think candidates for the Army should pass through the Auxiliary Forces first. I believe they learn very much more practical work in that way than they do by going through Sandhurst or Woolwich. I have thought so for many years, not merely since I have taken to my present profession. Those who care to look up ancient history will find a proposition put forward by me twenty-seven years ago on this particular matter. I think it is far better a boy should learn the practical side of his profession in some form or other with the Auxiliary Forces before he enters the Regular Forces, and I believe that this is more valuable than any amount of theoretical instruction that we obtain either at the Military College or Military Academy; but, of course, it is necessary to insure that an officer comes up to a reasonable standard of intellect. I fail to see any other plan of obtaining that standard than a competitive examination of some kind. If we lived in Utopia we might do away with competitive examination, but we are living in the twentieth century, on this earth, and I do not see that any system devised by human mind can be put forward to do away with competition, except at the expense of introducing unsuitable persons. I venture to say that a good many officers have been let into the Army lately whose mental capacity is not quite up to the requirements of the ordinary situation in which an officer finds himself. Dr. Warre's proposition in this regard is much like that which obtains in Germany. A German to be an officer in the Prussian Army must pass first of all an examination of a higher class than any examination for matriculation at an English University, but which is the German University matriculation examination, and failing that he has to pass a special one. I think that system is a very good one. I am inclined to think that candidates for commissions should go to an Auxiliary regiment and

there learn the A B C of their profession. Afterwards I don't think it matters materially in what system he competes, as long as it is a sound system of examination. There is only one point that does strike me, and one to which Major Hoare alluded, and that is, the difficulty there will be in a Public School of seeing that the instruction is what it ought to be. There is no doubt about the capacity of the schoolmaster, but his lines have not lain in the way of learning military matters, and hence, if he is to be an instructor in them, we must first of all look after his knowledge and see that he is capable of teaching. Otherwise the certificate of proficiency or certificate of efficiency, which would be obtained under his rule, may be of a very poor character indeed. I quite support what Dr. Warre says about making instruction interesting. I believe that even at Public Schools a good deal might be done in that direction with the subjects at present taught there, and certainly, if the new military subjects are introduced, this should not be lost sight of. I do not think that you can make the Militia officer who is going into the Army supernumerary to the strength. I will tell you why, and I have the authority of two Secretaries of State on this matter. Both of them have told me that if you did not give any commissions to the Militia officers you would not get them to join the Militia. I am old enough to remember when the Militia had no officers at all to speak of, because there was so little inducement for anyone to take a commission in the Militia. As soon as the system of giving Army commissions to Militia officers was introduced the Militia ranks began to fill up. If you were to make them supernumerary you would not get sufficient gentlemen to join to fill up the vacancies thereby created. At the beginning of the century the Militia ranks were always full, because the Militia was embodied. We have just seen the same forces acting again. But in the piping times of peace, when the Militia is not embodied all the year round, then you have some difficulty in filling in the commissioned ranks, and that is especially the case in the Artillery Militia. I do not think any interference with the present system of having the officers who are going into the Regular Forces counted as *bonâ fide* officers of the Militia could be done away with except at the cost of the efficiency of the Militia.

Colonel J. A. FERGUSSON, *p.s.c.* (Professor of Tactics, R.M.C., Sandhurst):—As my brother, Sir James Fergusson's, name has been mentioned, I should like to say that he wished to be here and take part in the discussion, although I have no idea what line he meant to take. He had, however, a very important meeting elsewhere, which may last until this one is over. I think we have listened to an epoch-making lecture. I do not know whether the lecturer prefers to be called Colonel Warre in this theatre.

Dr. WARRE :—No, no.

Colonel FERGUSSON :—Dr. Warre has put the nation under a great obligation, and has earned its gratitude. Whether he will get it or not is another matter. I remember when, seven years ago, I was appointed to the office which I practically vacate to-day, my heart sank when a lecture was put into my hands called "The History of Tactics," by Dr. Warre, and I felt even more than before, if possible, how inadequate I was for the duties of the office which I had just been appointed to. It was delightful work, but the office had a terrible name, which I have always repudiated. But, as a humble lecturer on tactics for seven years, I hope to be allowed to say a few words on the paper to which we have just listened. Perhaps I may begin by saying respectfully where I differ from Dr. Warre. Beginning at the end of his lecture, I cannot help remonstrating with him for going out of his way to attack Sandhurst. I do not pretend that Sandhurst is perfect, but I do say that if you compare the raw material which we get there with the finished article which we turn out at the end of eighteen months—I am sorry to say it is only a year now—the difference is so great that their own mothers would not know the young men, and I am quite sure the Head Master (who, perhaps, has not always the same personal acquaintance with a

boy) would fail to recognise them if they went back to the Public School where they had been trained. I can speak with more freedom to-day than I could have done a short time ago, and I should like to say, on behalf of the young cadets, that they show the best tone, that they are manly and gentlemanly in manner and demeanour, and that, whatever outsiders may say, their character is high. Drunkenness is unknown, and the medical officers say that there is no indication whatever of worse evils than drunkenness. They are delightful to deal with, and I am proud to have been connected with them for seven years, and feel the greatest affection for those who have passed through my hands. What I have to say about Sandhurst is this: that I maintain that, with all its faults, it affords a splendid training for the officers of the Army. I entirely differ from my old friend behind me (Captain James) when he says he prefers the training of the Militia officer for the Army. If he is right, why is it that the great majority of adjutants are Sandhurst boys, and the majority of Staff College officers? That is an absolute fact. It has been proved by statistics quite lately. As regards the Primers which Dr. Warre speaks of, I do not know whether he has seen our latest text-books at Sandhurst on tactics, military law, and organisation; but I do not think that a Primer which a boy at school would have to master need be so very much cut down from the text-books lately introduced at Sandhurst. Before I had read Dr. Warre's lecture I was thinking what I should like to say to-day on the subject announced, and I was delighted, on reading the lecture coming up in the train, to find the hit he makes at militarism and departmentalism. I want to speak with much respect of the late Secretary of State for War, but I am sure many must have regretted to see that he had condescended to encourage the vulgar and ignorant prejudice against what people are pleased to call militarism. When I was young there was a story of a young fellow who used to go about saying to all and sundry, "Can you box?" If the answer was "Yes," he used to run away. If the answer was "No," he used to say, "Then come on!" If the manhood of the country is trained for self-defence it is the very opposite of militarism; it is the very thing that will keep this country out of war and preserve to us the blessings of peace. It is for that reason that I want to support with enthusiasm the proposals of Dr. Warre to-day. Then departmentalism—how terribly the Army and Navy suffer from that! It is an open secret that long before this present war commenced the military authorities wanted to lay in, in anticipation, a large number of remounts and a great increase of transport, and the officials, I suppose of the Treasury, stopped it. The present Chancellor of the Exchequer, two or three years ago, made a speech which showed him to be as ignorant as a child of the real needs of both the Army and the Navy; and yet that same Minister goes down to the country and makes a fire-eating speech in which he seemed to be willing and ready to "take on" all Europe. When the demand is made by experts who know what the country wants for more horses and more transport, that same Minister at the head of the Treasury prevents these necessary preparations which might have made the massacre of Magersfontein impossible, and have shortened the war by three months at least. How one wishes that the £1,000,000 which was wasted by that same Minister on taking off the tobacco duty, as a sop to the tobacco manufacturers, had been spent in these necessary preparations for this great war! Dr. Warre has mentioned the shortness of officers in the Volunteers and in the Militia. I think, if my memory serves me, he has even understated that. It is a very serious matter indeed. Dr. Warre has spoken of the effect on character of these Cadet Corps at Public Schools, and I am sure he is right. I have some right to say so, because my only son, whom I lost the other day at Ladysmith, was Captain of the Cadet Corps at Marlborough; and I know well the effect which serving in that corps for some years had in forming his character, and preparing him for the greater duties of the Service. The authorities will do well to in every way encourage these school corps. I thank Dr. Warre for his mention of the "Lads' Drill Association" (of which I am a member), to which Lord Meath has

devoted so much time and energy. I agree with him, and I differ from a previous speaker behind me, as regards the uniform. For the smaller schools I think it would be a pity to make the uniform compulsory. I have had something to do with inspecting Church Lads' Brigades. I have gone into camp with them, and nothing could be smarter than the boys are with a belt and a neat cap. You get great numbers to join from the absence of expense with regard to uniform. Of course, in the great Public Schools expense is no object, but the smaller schools would gratefully accept that suggestion. I venture to think that Dr. Warre goes a little too far in that memorandum which he read to us as regards the instruction which should be given at Public Schools. Of course these are all details, but I suggest that the theory of projectiles and of explosives is rather going beyond the scope of what ought to be undertaken. I think it would be a grand thing to teach the elements of tactics, musketry, and drill. Do away with marching past and that sort of rubbish, and the time saved in that way should be devoted to teaching extended order drill and rifle shooting. I differ respectfully from Lord Brownlow on the subject of compulsion. I earnestly hope that anything like compulsion or coercion will be kept out of this scheme. There is something abhorrent to the nation in the word compulsion. I really think, if I am not speaking profanely, that if you made salvation compulsory it would be unacceptable to the British people. That we shall come to universal service for home defence I do not for a moment doubt, but we must keep out the words compulsion and conscription.

T. MILLER MAGUIRE, Esq., LL.D. (Inns of Court V.R. Corps):—I will just begin by protesting to some extent against the remark of my distinguished friend, the Professor of Tactics at Sandhurst who says there is something alien to the British taste in the word compulsion. Well, we are compelled to pay our taxes. We are under compulsion from the cradle to the grave. Primary education is compulsory, registration of death is compulsory. With regard to military art, when England was doing best, she was under rigid compulsion. Our old baronage held their property by military service till 1660. Soldiers and "shipmen" who were compelled to fight won the battles of the so-called "Hundred Years' War, 1339-1453." Soldiers who were pressed fought upon Marlborough and others in the war of the Spanish Succession, 1702-1713. Sailors who were pressed won the great victories of Hawke, Rodney, and Nelson. In the time of Buonaparte's Consulate there was a Military Service Act, which compelled every able-bodied Englishman and Scotchman to be either a Volunteer, a Militiaman, or a Regular soldier. At the beginning of the Seven Years' War, William Pitt had a compulsory ballot for the Militia. In point of fact, in the past we never engaged in any long-continued campaign, naval or military, in which recruiting for active service was not largely under the influence of compulsion, and the mass of our manhood were ordered to learn and practise the military art in times of peace. I do not care myself whether you call the service of a man who is pressed conscription, universal service, or what not—"You must be a soldier and you must fight," are orders good enough for him. But inasmuch as our upper or richer or leading classes are not compelled to learn anything about war in practice or in theory, I take the gist of Dr. Warre's address to be as thus: there is no compulsion, and, accordingly, a very large portion of our upper and middle classes pass through life as electors and discharging duties upon which the fate of the Empire depends, without the slightest notion of the military requirements of the State, without the smallest knowledge of the art of war, and without either theoretical or practical knowledge of military duties. Now, this is not the case with any men of the same position on the Continent of Europe. If we ever go to war with Continental Powers we shall be fighting with races who are under compulsion to fight—every able-bodied man of them. How would the Boers, even, irregulars though they be, have procured their soldiers but for "commandeering"? Whatever civilised or semi-civilised race we go to war with, it will be found that the upper classes have learnt and learnt well the leading principles of the art of war.¹

¹ Even the Chinese seem to have learned much since 1895.

Our upper classes have not learnt, as a rule, well or ill, anything about the art of war. The German gentleman must do one of these things: he must become an officer or he must become so well versed in general knowledge, including largely military history at an early age, that he need not become a private, and is allowed to become a Volunteer at his own expense—he must, therefore, become an officer, a Volunteer, or a Regular conscript private. Dr. Warre has evidently carefully observed these facts, and I think, I have caught the leading idea of his admirable address. Dr. Warre, feeling that there is something wrong in our neglect of the leading principles of political theory and of historic experience, wishes to do the best that in him lies, so that the gentlemen under his charge and the charge of his fellow instructors, the *élite* of the nation, who are bound to lead the nation in time, should not, in regard to the most vital matters in the life of the nation, be mere “blind leaders of the blind.” He wants, therefore, to educate not only those who wish to become officers in the Regular Army, or who wish to become officers in the Militia or Volunteers, and who will thus get a smattering of the military art before they become ordinary citizens and electors and legislators. I may venture to make a suggestion. I would suggest that more attention should be paid to the military training, more especially the theoretical part of it, of persons who are likely to have a chance of becoming Cabinet Ministers than of any other class. Dr. Warre has a chance of sending into the world a very large proportion of the officials whose departmental absurdity Colonel Fergusson has so ably censured, and I think that if the average Cabinet Minister were compelled, *vi et armis*, by Dr. Warre’s ingenious and very effective systems of advice and culture and compulsion to make himself thoroughly acquainted with military geography and military history before the age of 19, say up to the German average, we should avoid the repetition of a very large number of the blunders we have made in recent years. How many Cabinet Ministers have read a word of Hamley or any other treatise on the art of war, English or foreign, and yet they have dared in solemn conclave, to fritter away the interests of the nation and the lives of our soldiers? Dr. Warre says we wish to prevent fits of periodical enthusiasm and re-action. Well, has not the re-action upon our recent dejection and zeal occurred already? Our rulers are just sitting down and doing nothing, as if there had never been disasters in the present war. What has the War Office done to give us an efficient military force? Between the 1st September, 1870, and the end of November, 1870, the French Regular Army being utterly destroyed from a military point of view after their various disasters, the Government of National Defence absolutely caused to spring up like “the ancient dragon’s teeth,” 600,000 men well armed. What have we done? After the disaster of the second Bull Run between September, 1861, and March, 1862, McClellan organised the United States Army of the Potomac, 250,000 armed men. Nothing has been done except the preposterous and ridiculous suggestion, or the laughable idea, of amateur rifle clubs to save the nation, arranged by knights and dames of the Primrose League. This has borne no fruit, and cannot bear any fruit, except “apples by the Dead Sea shore.” I see that to allude to the knights and dames of the Primrose League in anything but laudatory terms would not be popular; but they cannot take the place of a proper martial organisation. It is merely folly to suppose that they could run an Army like the Swiss. We have here an excellent proposal of Lord Meath’s. How is that received? What did the War Office do with regard to that proposal? The War Office informed Lord Meath, if I am not very much mistaken, that they could do nothing for him or his cause at all—I do not know whether Colonel Fergusson agrees with me—on the ground that Lord Meath’s suggestion would not add “immediately one single defender to the forces of the nation.” Is not that a great example of departmental inefficiency, the quintessence of “how not to do it,” the result of the lack of the education which Dr. Warre would give? The very same official persons have for years been making “special enlistments,” giving daily instruction in barracks, and paying full wages to lads who by no possibility could be worth a

farthing for two years, and a large proportion of whom are mere Queen's "hard and bad bargains." With regard to the matter of rifle clubs and compulsion, what on earth is the objection to universal service such as prevails in Switzerland, and which has been admirably described in the *Nineteenth Century* by Colonel Rivett Carnac, and in a book recently published by Mr. Coulton? What harm it could do I do not know; but this I know, neither in Switzerland nor in any other part of the world will mere spasmodic or ill-regulated voluntary effort lead to military efficiency. I quite agree with the learned lecturer that there must be Government control and central organisation. And the people must see that our departments are willing and able to organise efficiently. Burke lays it down that we may as well expect without wind the waves to beat against the adverse shore, as any long-continued action of the people to be useful in the slightest degree without the action of the Government—the impulse from above. But we have neither statesmen nor organisation at present. With regard to the training in the Tudor period to which the lecturer alluded, in the times of the Plantagenets, Edward I., Richard II., as well as the Tudors, Henry VIII., Mary, and Elizabeth, all English folk were compelled, not only to learn military matters, but to avoid mischievous and evil games such as football, quoits, or any other assemblages for amusement whatsoever until all had first mastered and qualified in archery and tilting. Obligatory service was as usual as daily bread in the old days. The learned lecturer referred to the field service cap. Did he ever wear one? I have worn one often, and I did not like it. I have also worn the latter. I thought it a combination of a convict's and a dunce's. I am not a great admirer of conscription, of course, but I say that military training produces a distinctly good impression upon the masses of the people. It does not in the slightest degree deteriorate their mental or professional power. It has not injured the commerce of Germany or Switzerland. A working man in the Army, or a working man who is even a Volunteer, is a very different creature to look at from a working man who has never been into military service at all. In support of my theory I may mention that the merchants of Lancashire and Yorkshire formed a special commission to inquire into the state of the working classes in Germany, and the result was that it was found that the average German working man, as compared with the average working man in Lancashire and in Yorkshire, was as superior as Swift's Gulliver was to a Yahoo. Why not, in the primer of tactics, bring in strategy? I do not see much use in teaching tactics first. You ought to teach the military history of your country at large, and I hope all schoolmasters will begin to do that forthwith. The military history and geography of their Empire is an indispensable part of the education of every German, French, American, and Italian gentleman, and I could never understand why the military history and geography of the grandest empire on the face of the globe is not equally worthy of the attention of young English gentlemen. I would impress upon Dr. Warre to do all that he can in this matter. Dr. Warre has cut me to the quick by dreaming of the day when the present system by which a man has to cram for the Staff College will be abolished! I do not know whether Dr. Warre ever crammed himself. He may have crammed others, and I fancy he crammed himself, or he would not have been able to put in such a short space such an admirable deal of matter. I have been crammed, and I have crammed since I was 15 years of age. I crammed for my degrees, I crammed for the Bar—every barrister crams, every good medical man crams, and every wrangler crams. When I was trying to pass for a certificate for promotion in the Volunteers I crammed for all I was worth. I paid heavy fees to a sergeant in the Grenadiers, and he crammed me and no mistake. I can never forget him. If ever I had to pass an examination again I should cram. Every would-be staff officer who is ambitious ought to "put money into his purse," go to the nearest specialist, and work very hard to pass. With all due respect to Dr. Warre, if I was up on an examination to-morrow on any subject whatever, I would "put money into my purse" and I would fasten myself like a leech to the temple of some crammer and drain his brains till they were

dry. It is with the greatest pleasure that I have listened to the speech of the distinguished and able gentleman who has done so much good by inducing us to be more patriotic, and I apologise sincerely for occupying your time so long.

Major A. A. SOMERVILLE, 4th (Eton College) V.B. Oxfordshire Regiment:—May I be allowed to allude very briefly to one or two points raised by Major Hoare which are of importance to Public Schools? Before doing so I should like to assure Dr. Miller Maguire that we do try to imbue some at least of our future Cabinet Ministers with a few of the principles of military history, if not of geography. Some of us who know Major Hoare's keenness and efficiency in the cause of the Public School Volunteers, were rather alarmed when we heard him mention a long list of Public Schools whose views conflict with those of Dr. Warre, but it was re-assuring to find that the differences were in points of detail rather than principle. It was satisfactory to find that Dr. Warre's scheme has received in principle practically unanimous support. There are two facts we have to deal with at present in our system of National Defence: one is that the Volunteer system stands practically between us and conscription, and the other that there is a great deficiency of officers in the Volunteers. Dr. Warre's scheme is largely intended to supply that deficiency. It is not intended as a cast-iron scheme, but as a basis for discussion, and the points that Major Hoare has mentioned are matters of detail. He objects to the severance of the connection between the Public School corps and the local battalion; but I do not think Dr. Warre for a moment contemplates such a severance. We at Eton have always been intimately connected with the 1st Bucks Volunteer Battalion, and I am quite sure that Dr. Warre means that connection to continue. With regard to the question of musketry, I cannot help thinking that there must be some mistake when Major Hoare takes twenty as the average number of boys receiving musketry instruction in Public Schools. It certainly seems small. We instruct a very much larger number than that. At Wellington, where they have a private range, a large number of boys receive instruction, and also at Charterhouse, where they have been very successful. He is doubtful about our being able to afford the necessary instruction to boys at school. At present there is a regular system of instruction for sergeants' certificates. We wish to widen and deepen that instruction. It is rather a curious fact that we find those of our boys who have received sergeants' certificates, who go into the Army through Sandhurst or Woolwich, are very successful in becoming under-officers at Sandhurst and afterwards adjutants of their regiments. It shows to some extent that the instruction they receive is of use. He and other speakers are afraid that a certain amount of time will have to be taken from work or play in order to afford this instruction. If time has to be taken, it must be taken. Usually we are not accused of neglecting our out-of-door amusements at Eton, but we have begun to recognise that we cannot have the solid loaf of national wealth and prosperity without sacrificing some of the cake of leisure and recreation; and I think we are prepared, if necessary, to sacrifice some of our play time for the important object of national defence. I have had considerable experience of boys passing into Sandhurst during the last fifteen years, and I find that there they are smartened up, and get the idea of discipline. I see them later with their regiments, and I believe that British officers are probably unequalled in power of inspiring their men and leading them. What they do often lack is intellectual appreciation of their profession. Several times in the course of the present war our officers have been accused of being amateurs compared with officers on the Continent. I am afraid there is a great deal of truth in that, and the reason is not far to seek. The instruction they receive at Sandhurst and in their regiments is not such as to provide an intellectual stimulus. Therefore I look upon that part of Dr. Warre's scheme which suggests a Military University, through which all officers must pass, as most valuable. I think the result would be that the reproach would be no longer cast at our officers that they are amateurs in their profession. I would appeal to Major Hoare to do what he can to help on this movement, which has been started by two great forces—the force of national

necessity and our general anxiety to place on a more business-like footing our system of National and Imperial Defence.

Lieut.-General JOHN FRYER, C.B. :—I can only say what a great pleasure it has been to me to see Dr. Warre here to-day. I began soldiering with him over 40 years ago, when we were both privates together in the Oxford University Rifle Corps, and I am very pleased to see that he still retains his love for the Service ; and nothing but love would have kept him soldiering for such a length of time as has elapsed between 1859 and 1900. I do not propose to make any comment on the text of this lecture, but there are two matters, from my experience of the Service during the past 40 years on the active list, which make me think that I may possibly be of some small use in bringing before head masters generally, and there may be many masters of schools here to-day. The first is, I think our schools generally could with advantage increase their system of gymnastic training. I know in many schools there are very good gymnasiums indeed, but many young Public School boys join the Service with absolutely no idea whatever of anything like gymnastic training. I know also the objections there are to giving boys gymnastics, namely, that they may be overdone. That is quite true and a most serious thing, and it must be watched very closely. A medical officer should always say how much a boy is capable of going through. At all events, I would not have him go through too much. I hope that the masters who are here may be induced to give this training, and by doing so they will be giving a great boon to Her Majesty's Service. The next matter is one to which, I am afraid, very little attention has been given, but one which I consider to be at the present time one of the crying needs of all Britishers. When you hear me say what it is, you will perhaps say, What a small matter ! I will tell you at once what it is—the care of the feet of the youth of this country. People—and masters of schools—go for the head ; hardly anyone goes for the foot. At the present time there is such a thing as fashion. Fashion is an autocrat : he is an emperor, or she an empress—I do not know which to call it—but the foot is the most important part of a soldier. What makes me speak of it in reference to Public Schools is this. I have found that the feet of young officers joining the Service—I will not speak of the men, because those I have examined by thousands—but I have seen many hundred officers' feet, which I personally made it a point to examine, and I found, as a rule, in nearly all cases the toes are distorted when they come into the Service. The doctors have to examine them, and they are at liberty to cast them. At the time the boy comes from school he has elastic, india-rubber feet, and can endure the crushing of the boot toes. The rub comes when they are as old as captains. What I tell you now is a fact. I have often said, "I notice so-and-so on the sick list. What is the matter?" "He has been trying to do what he can to get his foot right." "So-and-so has had a toe cut off; another has had two toes off." I am telling you absolute facts. The fault lies with the neglect of the foot when a boy. Head Masters cannot tell boys not to wear boots with small toes, but they can do their best. It is one of the most serious matters. How often do we hear of a man who says, "I cannot walk. I do not like walking. I prefer riding." You will find, if you come to the real truth, that the man's feet are practically deformed. Most of the present boots are made to cramp the toes, and I ask Head Masters of Schools to send boys up for the Army if they possibly can with sound feet, and with *mens sana in corpore sano*, and by doing that they will do the whole nation an untold benefit.

Colonel the Rt. Hon. Sir JAMES FERGUSON, Bt., G.C.S.I., K.C.M.G., C.I.E., M.P. (late 3rd Bn. Royal Scots Fusiliers):—It has been a great misfortune and source of regret to me that I could not be present to hear Dr. Warre's most interesting paper. I had the advantage of reading it, and I did so with the deepest interest. It seems to me that it is a most valuable contribution to the consideration of, perhaps,

the most important question that could be before the nation at present. I only hope it will be widely circulated, and I think it cannot fail to attract a great amount of public attention. We are beginning to realise what national danger means; hitherto our troubles have been far away from home, and, perhaps, have not come close enough to our shore for us to realise what it means to be in danger when we are unprepared. We have lived in a false paradise for a great many years, and now, when our military resources have been strained to the very utmost, and we have been obliged to supplement the Army in the field with half-drilled men or undrilled men, the reflection has come to many minds, What would happen to us if at such a time we were called upon to measure forces with a great military Power? It is a very serious and alarming reflection. I agree very much with the last speaker, in the latter part of his remarks, that something much more thorough is required to put this country into a state of national defence. I cannot for the life of me imagine why we cannot submit to the same amount of compulsion, the same recognition of a great national duty, as the freest nation in Europe, Switzerland, does. When we examine the Swiss military system, and know how exceedingly small is the demand made upon the people of the country to qualify themselves for the national defence, that no man is withdrawn from industrial employment, and that the industries of that busy nation do not suffer at all from the short amount of training that is required of its citizens, while its population is enormously improved by the training it undergoes, we need not be surprised to find that they would not forego that training on any account. The districts take the greatest pride in the efficiency which their respective contingents attain. It only requires to be well understood in this country, and a little energy in our Government to get our country to adopt it. But if public men are too timid to appeal to the country for such a system, and a much closer danger is required to bring us to our senses, then surely some smaller expedients are not unworthy of notice, and ought to be adopted to bring us into a state of less unpreparedness than that under which we have been content to live. We owe a deep debt of gratitude to Dr. Warre for having come here to bring home to us what can be done to prepare the educated youth of our country for the position of officers of our Army and Reserve forces. I am sure he has proved to us how little those best qualified to judge need fear the compulsion that will be put on the older boys of Public Schools. There is one question which arises in reading his paper, which, perhaps, has been asked in the course of this discussion, and that is, whether the compulsory part of instruction that is to be given in the Public Schools is to be taken out of the boys' time, or out of the school time? In a recent examination that I was able to make of the system of drill introduced into primary schools in some parts of the country, the school inspectors laid great stress on the importance of the drill coming out of the school time, and not out of the boys' own time. My recollection of Public School boyhood is that it was very unpopular when a compulsory lesson came out of their own time. At the same time, those who are striving for "efficiency" and "proficiency" would not grudge some of their time to supplement that which is conceded to them from the school time, and, perhaps, if the compulsory part was taken out of the school time, they would be more ready to give up some of their own. But that the measure so proposed would be a most valuable instalment to national military education, which is so much desired, I entertain no doubt, and I shall certainly endeavour, in whatever sphere of influence I move, to encourage and promote the adoption of the proposition laid down by Dr. Warre as much as I can, and, if I can, will get it taken up by the Service members of the House of Commons.

Colonel W. T. DOONER, *p.s.c.* (Assistant Adjutant-General, Thames District):—The discussion has been so prolonged, that I will only trespass on your patience for a few moments. We are all, I think, deeply grateful to Dr. Warre for coming here to-day to read his paper, and all who are interested in the supply of officers for the Army must feel positively delighted that, as Head Master of Eton, he has given his

time and attention to this very important subject. The two points to which I wish to refer are Militia officers and conscription. With regard to the latter: Any form of compulsion for military service I do not think has yet come within the range of practical politics, and, in my opinion, therefore, Dr. Warre has been exceedingly well advised in changing, in the memorandum submitted to the Head Masters' Conference, the words "capable of bearing arms" to "able and willing to bear arms." As yet, conscription or any form of compulsion for military service has not been found necessary for our country, and I do not think that any Government, however strong, will have—shall I say?—backbone enough to propose it for adoption. It is against the views of the great majority of the people of these islands; and I consider it is a splendid thing to think that in our Army—alone, I may almost say, of all Armies in the world—there is not one man who is not there of his own free will. Our Army is absolutely voluntary, and I trust it will remain so. May I tell you what a lever voluntary service gives commanding officers when dealing with men in the orderly-room, who may have misconducted themselves? Whenever a man commits an offence, we can always say to him: "You well understood the Army and its discipline before you enlisted, you are here of your own free will, and why on earth did you join the Service if you meant to misbehave yourself?" I have found that argument a very forcible one when dealing with prisoners for the last ten years—five years in command of a regiment, and five years in command of a regimental district. It must be recollected also that any Government which proposes compulsory service will have to stand the attack of all Members of Parliament opposed to them on such a question. The opponents will be very numerous, and, during a general election, we should, I think, find the whole country placarded with those silly pictures, we are all so familiar with, of so-called deserters and men being dragged from the bedsides of dying fathers and mothers to serve in the Army; and I imagine the conscription candidate will cut a sorry figure at the declaration of the poll. I think, Mr. Chairman and Gentlemen, you may rest assured that conscription will not be proposed by the present or any Government for many years to come. The other point I wish to refer to is that of Militia officers. I have had some experience of them, and I am pleased to be here to stand up for them. I consider that the system of finding officers for the Regular Army through the Militia is a very excellent one for both Forces. The speaker on my left (Captain James) said just now that two Secretaries of State told him that had not the present system existed, the Militia would have been without any subaltern officers whatever. The lecturer calls them "birds of passage"; in a measure this may be a correct designation; but the point to recollect is that the so-called birds of passage are there, and on the strength of a battalion, when it is suddenly embodied, as happened recently, and thus a battalion, if suddenly called out for service, comes out fairly well provided with officers. But I should like to ask if we had not had the Militia officer to fall back upon during the present war, how would we have suddenly found candidates to fill the vacancies which existed in every battalion ordered on active service? I do not know, and I shall be very pleased if anyone will tell me, how the required officers would have been found to fill also the vacancies caused by the numerous casualties which took place in South Africa. Fortunately, the Government had not only officers, but educated officers to offer commissions to, as they had a host of these Militia subalterns and captains who had been up for the Militia competitive examination—men who had been exceedingly well prepared and instructed, but had failed possibly by only a few marks; and these officers were available to fill the vacancies. For the last ten years I have had experience, as a commanding officer, of the Sandhurst and Militia candidates for the Regular Army. Both systems, I venture to say, produce excellent results, and I do not want to draw any comparisons, but I do venture to urge that the Militia competitive examination gives the Army very good officers. They join with a good knowledge of their duty, the promotion examinations have little terrors for them, while as regards Sandhurst—well, I cannot

say that I have met any of the cases of "maternal oblivion" mentioned by a previous speaker. The lecturer mentions that the Militia officer who is a candidate for the Line should be considered a supernumerary; but this could not be carried out, as, although an officer may be a candidate, it would not be possible to know if he would be successful in the examination. The difficulty, however, could be met by raising the establishment to two subaltern officers per company, and thus if one battalion furnished a few successful candidates, it would not matter so much. I beg to thank you for your kindness in listening to me, and, in conclusion, I ask permission to say that all of us who take such interest in the question as to how the Army is to be officered must feel deeply grateful to Dr. Warre for coming forward at such a time as this with such an excellent scheme; and I feel sure we all wish him and Lord Meath god-speed in their noble endeavours to promote drill and Cadet Corps in all the Public Schools and other places of education in our country.

Fleet Engineer GEORGE QUICK, R.N. :—I beg leave to say a few words on the subject of military training for boys, because I have studied the subject for many years, and have not taken it up merely on the spur of present circumstances. In 1877 I wrote officially to the Admiralty to urge the advantages of military drill for the stokers and mechanics of the Navy and for the apprentices in the Dockyards, because I had for many years recognised the value of military drill for raising the human animal to a higher level of intelligence and morality. The value of military training as a means of mental and moral improvement was pointed out by the late Sir Edwin Chadwick in the early forties, by Dr. Sir B. W. Richardson, and by the late Dr. Carpenter in his admirable work "Mental Physiology." It has been frequently commented on in papers and in discussions at this Institution during the last twenty-five years, and yet, with Chinese-like obstinacy, this nation, as a whole, resolutely declines to move forward in this matter. The moment is fast approaching, if it has not even now arrived, when the British people, including our Cabinet Ministers and the "man in the street," must finally decide whether they will take their place amongst the dying nations, by sticking to their old, obsolete, and worn-out system, which, under the name of "voluntary," they worship as a fetish with all the blind enthusiasm of Negro savages, or keep their place at the head of all progressive nations by adopting the only method which is suitable to the present condition of affairs—that method which has been adopted and has been in use for many years by all the intelligent and thriving nations of Europe. I gladly welcome the paper of the Head Master of Eton as evidence that at least some people have awakened to the change in our condition during the past fifty years. But too many people of all classes still say: "Why should we follow Continental Powers in giving military training to all our people? Why should we not trust to our Navy as we have always done in the past?" The latter question may be answered very briefly, for never since the world began has any nation been able to maintain itself for any long period by reliance on its maritime strength alone, and there is no reason why we should be an exception to this rule. Of all things naval power is the most subject to accidents and unforeseen disasters; it is the most easily and the most quickly destroyed. This has been the case since the days of Carthage to those of Holland and Spain, and down to the period 1861-65, when the mercantile marine of the United States was ruined by the "Alabama" and her consorts. The Northern States had "full command of the sea," and that was a great benefit to them, no doubt, in many of their military operations, but that "command" did not keep their commerce under their flag. The Allies in 1854-5 had the "command of the sea," but the united fleets of England and France could scarcely scratch the Russians. The French had "command of the sea" in 1870-71, yet that did not save France from defeat and ultimate surrender to the German armies. The Japanese had "command of the sea" as against China, but that would have been useless to bring China to terms if the Japanese had not

had a powerful and well-organised army to take advantage of the opening made by her efficient fleet. We have had "command of the sea" as against the late African Republics, but in spite of that it has taxed all the military resources of this Empire to drive the shooting farmers of the Republics out of our own territories after eight months' occupation. Powerful and perfect fleets are as essential to our existence as strong legs are necessary to a prize-fighter, but we must have powerful and perfect armies as well as fleets, for they are as essential to us (with the enormous land frontiers of our Empire) as strong arms and hard fists are to the pugilist. The world has changed marvellously during the past forty years, and we cannot escape from the conditions of the present day by idly dreaming of the deeds of our great ancestors. All the intellectual power of Continental nations is now incorporated in the military or naval forces of those nations. The efficient performance of the duties of officers of the Navy and Army of this Empire demands the highest order of intellect and of moral character; and if the proposals of the Head Master of Eton be carried into effect, so that all the boys in our Public Secondary Schools shall have military training, we shall discover many, if not all, those young fellows who have a natural genius or instinct for war service such as Major-General Baden-Powell has shown. These men would naturally enter the Army as officers, while those who had discovered their unsuitability for military work would enter professions more suitable to their nature. If the poet is born and not made, the same applies to the capable officer, both naval and military. Thus we should get a supply of the very finest material that our race produces to constitute the officers of our Army. But we want every British boy trained, and here I will give an extract from a letter which I received last month from an old Russian friend, who is certainly not an Anglophobe:—"If I were a good writer, I would write a strong letter to all your big English papers, advocating a pet idea of mine, viz., that not only should the rifle be put in the hands of grown-up people, and rifle ranges be made more plentiful, but that boys should be given toys with which they could exercise themselves in aiming straight. The French have lately put on this market a toy pistol which shoots wax bullets, and with this children cannot do any harm to themselves or to their neighbours; at the same time they learn in playing *to aim quickly and to shoot straight*. It is not possible to make marksmen if one does not begin early in life. . . . If we wish to be familiar with weapons of war we must train the child. Look at our Cossacks! The very lullaby songs sung to them in their cradles are all warlike. And you can find no better shots nor better soldiers than our Cossacks. They are born warriors, and can stand more hardships than any other race I know. It is the child you must teach, the man can teach himself." Surely this is not the advice of an enemy! As regards the efficiency of the voluntary system to supply our needs under the stress of a great European war, I beg leave to quote some words from a speech made by Captain Gurden, R.N., to be found at page 249 of the JOURNAL of this Institution for 1876. Captain Gurden said:—"If the civil population can make a great deal more money by civilian pursuits than they can get in the Army, you cannot get your men. This was apparent during the Crimean War, when we could not get sufficient recruits, although we were offering high bounties; and we had to raise a German legion, an Italian legion, and a Swiss legion (not to mention the Turkish contingent); and if the war had gone on two years longer, half our actual Army in the field would have been foreigners." That is the absolute truth, and no high-flown words or bombastic declamations can alter the hard facts of the case or strengthen our very insecure position. At the close of this century, Englishmen must decide whether they will be dominated by a dead past, and thus fall amongst the dying nations of the earth, or will they learn the lesson of the living present and attain to that tangible and national immortality which is within their reach, if they will but adopt the wise example set them by some of the Continental States. Some three years ago I addressed a letter to the Commander-in-Chief, in which I stated my conviction that the time had arrived

when "Every British man should be a trained soldier and marksman, and every British woman should be a trained cook and nurse." This work of universal military training must be begun immediately, we have no time to lose, and then in a few years we may be in a position of decent safety, we may be able to secure peace for ourselves; but if Englishmen consider that their freedom, their honour, and their glory are not deserving of a few hours' military training, from every man and every boy in this island, then, indeed, our end as an independent nation is assuredly not far off. We shall certainly not deserve to survive even if we spend a few more millions a year to pay professional soldiers and sailors to fight for us. I do not advocate *compulsory military service* for all, but I do protest that it is absolutely necessary that there shall be *compulsory military training* for all males under nineteen years of age, or until a certificate of efficiency as a soldier and marksman be obtained. That is the irreducible minimum necessary for our survival as a race of free men. We must leave to the War Office the duty of providing arms, ammunition, transport, stores, and organisation generally; it is for the nation, the people themselves, to provide the trained men. It is the most urgent duty of the present Government to provide immediately a grant of at least five shillings per head per annum for the military drill of all boys under fifteen years of age, and of ten shillings per head per annum for the military drill and training of all boys over fifteen years of age, on the systems which have been so ably advocated by Lord Meath and the Head Master of Eton. We must "clear our minds of cant" and face the world as it is to-day—we must either drill or die.

Lieut.-Colonel R. HOLDEN (5th Bn. Worcestershire Regiment):—Dr. Warre's scheme seems to be worthy of serious consideration, but I take the liberty of differing from him in some details. It is generally based on very sound principles—principles which have been enunciated by the greatest masters of the art of war, but which, unfortunately, have never found favour in this country. Chief amongst these is the necessity for studying, when young, the military art, including military history. As a humble student of military history I regret, with Dr. Maguire, that the subject is ignored in nearly every Public School, including Eton. And I regret to find that, in the course of instruction now suggested by Dr. Warre, military history is not considered worthy of a place. The ignorance on the part of the ordinary Britisher of the military history of his country is lamentable. I doubt if two in every ten members of the House of Commons could even name a battle in the Peninsular War. Yet scarcely a military commander of any eminence has failed to advocate the study of military history. The conditions of war may vary with the progress of weapons, but there are certain teachings which remain constant and rank as general principles. There are men like Cromwell who have risen to fame, whose military education was of the scantiest, and whose professional training was confined almost exclusively to its practice in the actual theatre of operations; but the greatest leaders of ancient and modern times have emphasised the importance of a study of theory, with which history should go hand in hand. With its graphic descriptions of actual fighting, history covers the dryness of theory with what is interesting and elevating; and I cannot help thinking that a great portion of that result which Dr. Warre's scheme aims at bringing about is more likely to be produced by a knowledge of military history than by the study of such matters as the theory of projectiles. Nevertheless, I think it will be generally admitted that his scheme is one in the right direction; it favours, and I think rightly, the study of the military art when young, as is done in the Royal Navy, and as used to be the practice in the Army when our leaders were certainly not less capable than they are now. Up to within the last eighty years officers in the Army commenced their military life at the age suggested by the Committee of the Head Masters' Conference as that at which all persons *in statu pupillari* should be enrolled for the purpose of instruction in drill, manoeuvre, and the use of arms—fifteen. Most of our great generals, prior to the Crimean period, were serving in the Army at that age; General Wolfe was only fifteen when he was adjutant of

his regiment. For two reasons I regret that Dr. Warre has substituted for the compulsory words in his scheme those of "able and willing to bear arms." I am not in favour of either conscription or compulsory service, but I am in favour of universal liability to service in the *defence of the country* on the part of adults, and of the compulsory military training of the youth of all classes of the community. I disagree with Colonel Dooner. I cannot understand how any man of ordinary public spirit, physically fit and in possession of his faculties, can object to being rendered liable to defend his country in the event of emergency. In the case of a street brawl or drunken riot, a police constable is empowered to call on any man "in the Queen's name" to assist in the preservation of order. Yet in the event of a serious national emergency, when the very existence of the Empire may be at stake, we cannot call upon a single able-bodied man "in the Queen's name" to lend a hand. My second objection to Dr. Warre's alteration is that, as the military training of the boys becomes optional under his scheme, things remain very much as they are, and he would appear to be in a position to commence operations at once without calling in the aid of an Act of Parliament. Major Hoare attaches great importance to the minor details in Dr. Warre's scheme; his remarks refer chiefly to details of drill, musketry, uniform, etc. In the matter of uniform and titles I prefer Dr. Warre's ideas for school corps. But if the boys at Haileybury are likely to make more rapid progress in the military art if dressed in the uniform of the Regular Army, by all means dress the officers as generals and the cadets as Guardsmen. I fail to see Major Hoare's argument in regard to the importance of a territorial title for his school corps, for the reason that I cannot conceive that a boy born, say in Scotland or Ireland, and educated at Haileybury in Hertfordshire, with the intention of eventually entering the Cavalry, Guards, or Rifle Brigade, or perhaps becoming an officer of Auxiliary Forces in his native county, can be deeply stirred by wearing "Bedford" on his shoulder-straps—that being the title of the county regiment to which the Haileybury corps is affiliated. It is a curious fact that amongst the most distinguished Volunteer corps in the country are those which have not adopted either territorial designations or the uniforms of their affiliated regiments. Take, for instance, the University Corps, the London Scottish, Queen's Edinburgh, Queen's Westminster, Artists, Civil Service, Inns of Court, London Rifle Brigade, etc. I think Major Hoare has rather over-stated the difficulties in the way of the musketry and other training of school corps. I am connected with the 1st Cadet Bn. of the King's Royal Rifle Corps, generally recognised as the leading battalion of its kind. It is composed of lads of the superior working classes, not under 5 feet 3 inches in height. We have no difficulty in putting nearly every lad through a course of musketry at 200 and 500 yards, and in training him efficiently in other subjects. And what is possible with London working boys, who have only the evenings and Saturday afternoons to themselves, should be easy in the case of a Public School Corps. Dr. Warre's scheme for the establishment of a military university is worthy of serious attention. Colonel Fergusson's argument in favour of the superiority of the Sandhurst over the Militia candidate is not convincing. He relies on the assumption, which has yet to be proved correct, that a Staff College officer is superior to one who has not graduated at that establishment. The Sandhurst Cadet may be superior, but this superiority is not, I submit, very apparent, in view of the fact that the majority of our best leaders do not possess the letters *p.s.c.* Amongst these may be named Lord Wolseley, Lord Roberts, Sir Redvers Buller, Sir George White, Lord Kitchener, Sir A. Power-Palmer, Sir Henry Brackenbury, Sir C. Mansfield Clarke, Sir Baker Russell, Sir Charles Warren, Lord Methuen, Sir George Luck, Sir A. Hunter, Sir Leslie Rundle, Sir H. Chermiside, Generals French, Lord Dundonald, Baden-Powell, and many others. Quite a fourth of the field officers now serving, who entered the Army through the Militia, are, or have been, employed with credit on the Staff; while a very fair percentage have passed the Staff College, if that is accepted as evidence of superior education.

Colonel E. CLAYTON, *p.s.c.* (late Royal Artillery):—I most cordially agree with Dr. Warre as to the advantages of Public School Cadet Corps, and hope that the movement for their development may be successful. I may say that my eldest son has just joined the Cadet Corps at Bradfield. I think that the question of compulsion is one that requires careful consideration. Unquestionably there should be no compulsion to become enrolled Volunteers, but if it were left completely voluntary whether boys should join the instructional corps or not, I do not think it is clear that many more would join the corps than do so now—a small proportion of the boys at any school. The suggestion may be made that training in instructional corps should be part of the curriculum of schools, to which all boys in the natural course would be subject, but which might be dispensed with if parents or guardians wished it. There should be no obligation to go further and become enrolled Volunteers. The instructional corps should be affiliated to brigades for the purposes of instruction and inspection, but should not be included in the distribution of the brigades for the defence of the country. The question of uniform should be left to the option of the different schools. Probably it will be found impracticable to give time for the extended course of instruction advocated by Dr. Warre if the strength of the corps is largely increased. The main things to be sought for are to give sound physical training, to teach habits of discipline and self-reliance, and, at all events, to awaken the military sense. This could be done by carefully regulated physical drill and gymnastics, by drill and elementary tactics, and musketry if circumstances permit it. The theoretical instruction should by all means be reasoned and made interesting and not be merely dogmatical, and the drill should be suited to modern conditions. I would finally suggest that a conference should be held of representatives of the Public Schools and of military men who are interested in the subject, for the purpose of formulating a scheme which should be generally acceptable to the conference and which could then be laid before the Government and the country.

Lieut.-Colonel R. E. W. GARNHAM (late commanding 4th Battalion Duke of Wellington's (West Riding) Regiment):—The desire of the lecturer to secure as officers, men "from their boyhood imbued with the first principles of military knowledge," is a most laudable one, as hitherto too little attention has been paid to the explanation of the principles of drill and tactics, and such explanations, given to future officers when young, will be far better than learning by rote in after years. A great difficulty now exists as regards proper instruction in the field at manoeuvres and camps in scouting and taking cover, owing to the large space required for large bodies of men to be so exercised (plus spectators), but it may be hoped that owners and occupiers of land may be led to allow smaller bodies of boys (under proper control) a wider and more varied range, in proportion to their numbers, at certain seasons. As regards cramming, the evil seems to be that officers are crammed for competition upon subjects which are not likely to be of any subsequent use, and that, after abnormal stuffing of their brains, they are left without any mental pabulum whatever, so that what they have learnt as an effort of memory passes out of their minds and leaves a vacuum. A different result arises from such practical teaching as that of the Chatham School of Military Engineering. What is learnt there can be retained for future use, but an officer with it and Baden-Powell's "Scouting" at his fingers' ends might fail to get into the Staff College because deficient in higher mathematics, for which he would probably have no use on service. While cordially approving of the lecturer's scheme as a whole, and leaving details to be settled by those best fitted for that work, I venture to express a hope that it will not be drawn like a red herring across the scent of other more pressing needs, especially that of the gradual but universal instruction of all males between certain ages, who are capable of bearing arms. This instruction should be done in such a manner as will least interfere with civil occupations, and has no affinity with the boggy of conscription, in the Continental sense, which takes men away from their homes and occupations for

long periods; nor would it affect the voluntary system as regards our Regular Army, while that might be maintained in the Militia by the payment of the present bounty up to a certain number, and in the Volunteers by the capitation grant with a similar limitation. Any intelligent man would soon be able to obtain a covering certificate, and be released from further service for a given number of years, with only occasional attendance at drill or on a range. The existent Militia Ballot Act, which has already been put in force in this country, and is now only suspended from year to year, could easily be revised so as to meet modern requirements, and any difficulties which attended its operation in the past could easily be removed, while through it we should learn what is the number of men fit to bear arms in defence of the Empire, and by their gradual instruction we should secure the trained men required for home defence, and probably also greatly stimulate recruiting for the Regular Army and Marines. It is, of course, to be understood that provision should be made with respect to Naval Volunteers, so that not only would military strength be increased, but our naval strength also, all being liable for instruction in the Militia, Naval Reserve, or Volunteers.

Dr. WARRE, in reply, said :—I must go to catch a train, but might I be allowed to thank those who have spoken for so many kind things said about the lecture? I hope I have not really done anything wrong in saying what I have said. There are only one or two things I should like to add: first of all, I wish to assure Major Hoare that I did not intend in the slightest degree to destroy any local connection, or to make any difficulty about ranges, or to cause any changes of uniform. Nothing was further from my thoughts. With regard to what Lord Brownlow said about compulsion, the alteration in the memorandum was made by the advice of Members of Parliament and others, who told me that the mention of compulsion would raise such an amount of opposition that it would be impossible for the Government to adopt the scheme as proposed. Under these circumstances, it is probably right to select the line of least resistance. With regard to what fell from Captain James about schoolmasters' teaching, I am sure I do not wish the substitution of schoolmasters for military men to teach military things; but I think schoolmasters, by degrees, as they become more and more acquainted with the subject, will be able to communicate a certain amount of instruction bearing on military matters. Moreover, they will have the assistance of instructional officers if the scheme of instruction be carried out in its entirety. I should like also to assure Colonel Fergusson that I do not wish to make any attack on Sandhurst. What I feel is, that I should like to see Sandhurst not a school, but a University. I should like to see it rise to a higher stage. It should receive all officers for at least three terms (not necessarily consecutive terms) before they could attain to field rank. A man should get his military degree before he could rise to field rank, having passed, perhaps, two terms before he became a captain, and one before he obtained his majority, and, I repeat, I do wish it to be understood that I deprecate very much being thought to make any attack on Sandhurst. I do not make any attack upon it. I honour the work that it does very much, and for what it has done for some whom I know I feel very grateful for it. With regard to what Dr. Maguire said about cramming for Sandhurst, with him I am ready to confess that I crammed for many things, and I think everybody else has at some time to cram. What I meant was that I should like to see every officer obliged to go to the military university and be commanded to go, whether he crammed or not. The system by which officers can only get in by competition and cramming is not, in my opinion, a right system. I do not think there is anything else I have to say, further than to thank you again most gratefully for the kindness which has been shown to me.

SPEED IN NAVAL TACTICS.

From an Article in the "Rivista Marittima" for January, 1900.

By Lieutenant ROMEO BERNOTTI.

Translated by Fleet-Engineer T. J. HADDY, R.N.

THE object of this study is to contribute something towards the carrying out of the now generally admitted ideas of naval tactics. Amongst the many teachings which Captain Bonamico deduced from the Chino-Japanese and the Spanish-American wars are the following:—

1. The battles of Cavite and Yalu have indisputably demonstrated the great tactical efficacy of speed.
2. Speed is the arbiter of the tactical as of the strategical situation.
3. The value of the armament is subordinate to the conditions of their employment, and the latter to speed.
4. Superiority in speed permits of the employment of guns having superior range, with impunity.
5. The gun is demonstrated to be, in virtue of speed, the exclusive and decisive arm of battle in actions between ships and fleets.
6. High speed chooses the enveloping formation for the combat.

In order to carry out these principles in action, it is necessary to have clear ideas on the development of the duel at a distance; an accurate study, therefore, is necessary, without which it is not possible to obtain the full value of preponderance in speed, since the enemy might be able to profit by errors on this head and succeed in establishing a duel at close quarters. "In all times," lately wrote Captain May, of the English Navy, "with all arms, either on land or sea, experience shows that the victory will remain with the one who fights in accordance with a well-defined plan and in agreement with its laws; whilst defeat is fatally the lot of him who, having no fixed laws to guide him, trusts to the inspiration of the moment, or who trusts alone to individual talent and the qualities possessed by each of the units composing his fleet." Admiral Fournier was the first to attempt the study of this combat at a limited distance. He proposes to make the opponent having the advantage in

speed to manœuvre on the curves of a logarithmic spiral, having the pole in the successive positions of the slower enemy, and inclined to the radii vectores at an angle the cosine of which is equal to the relation between the speeds of the two ships or fleets. He demonstrates, in fact, that if the slowest opponent follows a radius vector of the equiangular spiral, the distance between the adversaries will at first increase, and then diminish, till it returns to its initial value, when the faster passes in the direction of the bow of the other opponent.

Messrs. Tournier, La Porte, and Coton, officers of the French Navy, examined into the practicability of Admiral Fournier's proposals; and not being able to deduce the variations in distance between the adversaries analytically, they studied the problem by means of three diagrams, and found very considerable variations. We also, before discarding these tactics of the equiangular spiral, have repeated this examination (Chap. II.), finding a method of calculating the changes of distance analytically, and our results, which are in line with those obtained graphically, differ from the conclusions of the French authors. Captain Bajo, in his article "Reflections on actions between ships," published in the *Rivista Marittima* for April, 1897, furnished a genial contribution to the tactics of Admiral Fournier; with the instrument we now have to discuss, and which forms the object of our study, his ideas also can be translated into practice with the greatest facility. These tactics, however, of spiroidal evolutions have the defect of supposing that the enemy will manœuvre in a manner which does not permit of the fullest utilisation of his power: from this, as we shall also show analytically, arises the idea, not of action at a limited distance, but of action at a constant distance. The first study of this question under a purely theoretical form is due to the three French authors already cited, and Captain Ronca, in the *Rivista Marittima* of June, 1897, remarks on its usefulness. Such studies naturally lose much of their interest, since they do not issue from the field of speculation to enter in a complete form into that which is practical; and to this we have endeavoured to conduct them by means of the instrument which we shall propose. Let us remember, to avoid misapprehension, that for the application of the tactical theories originated by Fournier, the existence of a relation between the speeds is sufficient without any regard to their actual value. A large part of the problems which present themselves in the study of modern naval tactics can be practically solved by our instrument, to which we have given the name of "Cinematic Indicator." In fact, it affords a method of following the equiangular spiral (Chap. II.); it is applicable to tactical problems of the naval blockade (Chap. III.); to the problems of the action at a constant distance (Chaps. IV., V., and VI.); and to the variations of distance and bearing between ships (Chap. VII.). Naturally, in order to arrive at a practical method of solving these problems, we have been obliged to study them first by analysis; and by employing the formulæ to which we have been led, we have been able to note the eventual errors which may occur in the use of the instrument. The Cinematic Indicator requires in the person using it the practice and the sharpness of vision

acquired by living at sea ; it permits the slow combatant to profit by the errors of the enemy, and enables the fast one to impose the action at a distance. For these reasons we believe that used by one convinced of the tactical theories on which it is based and who is at the same time practical and skilful at manœuvring, it will prove a most efficient help.

CHAPTER I.

The Cinematic Indicator (Plate 6) is composed of the following parts : First, a horizontal metal disc of 20 centimetres (7·87 inches) radius, on which is engraved the circle *BBB* of 10 centimetres radius, graduated from 0° to 180° on either side of the diameter *ZZ*. The disc must be fixed with the direction *ZZ* parallel to the longitudinal axis of the ship. In it is a circular aperture *b* concentric with the circumference *BBB*. Secondly, two graduated arms *QQ'* and *Ox*, of which the first is known as the index of direction, the second as the index of bearing. The latter is channeled out longitudinally. The arms *QQ'* and *Ox* have their respective cylindrical pivots *c* and *d* bored out in the axis, and are fitted the one in *b* the other in *c*. By means of the pivots *c* and *d* these latter can revolve with friction around a vertical axis passing through *O*, the centre of the instrument ; *Ox* is placed above *QQ'*. Thirdly, a runner *R*, which slides in the grooves channeled out of *Ox*, as shown in section *gg'*. As indicated in the figure, the upper part of the runner *R* is formed into a cylinder, the axis of which is central with the guides in *Ox*, and stands vertical to it. Fourthly, a graduated arm *yRy'* with a circular aperture at its central part working with friction on the cylindrical pivot of *R*. The arm *yRy'* has, therefore, two motions—one of translation, and the other of rotation ; it is called the sliding arm, and is channeled out longitudinally. The inside faces of the groove are bevelled off, so that the point coinciding with *BBB*, or of intersection with *QQ'*, may be observed. Fifthly, a circular index *MM*, with its centre in *O*, and having a radius of 5 centimetres (1·97 inches), is fitted to the horizontal arm *Ox*, and in the same horizontal plane as its upper face. It is symmetrical with respect to the index of bearing, and the graduation 180° corresponds with the centre of the guide. It comprises two right angles, but each quadrant is divided into 180 equal parts, numbered as if they were degrees. In order to fix the arm *QQ'* to the disc, the fittings *D* and *F* are carried on it, which form the jaws of a small vice closed by the pressure screw *E*. It follows, from what we have said, that when the screw *E* is free, by revolving *QQ'*, *Ox* and *yRy'* are also moved ; when the pressure screw *E* is fixed, *Ox* is rendered independent. At the extremities *y* and *y'* of the sliding arm, and at *O'* and *x* of the bearing arm, are the conical sights *m*₁, *m*₂, *m'*₁, *m'*₂. The piece which carries *m'*₂ is fixed by screws to *Ox*, so that the runner *R* can be placed and removed. The length of the index of direction is equal to the diameter of the disc. The distance between the extreme points of the sliding arm is equal to the sum of the diameters of the disc and of the conical sights ; that between the corresponding points of the index of bearing is the sum of the radius

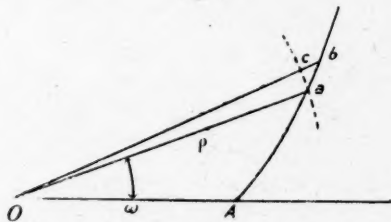
of the disc, of half the length of the runner R , and of the diameters of the bases of the conical sights, so as to permit of the centre of the sliding arm being brought to coincide with the centre of the disc O . In the channeled or grooved arms, the graduations are engraved on both the lateral parts; the arm QQ' , which is solid, is only graduated at the centre. The diameter Z_1Z_1 of the disc, a prolongation of ZZ' , as well as the arms QQ' and $y'Ry'$ are graduated, commencing respectively from O and from R , in parts of the radius BBB ; the numbers 1, 2, 3 . . . 20 are tenths of the radius, or centimetres. The bearing arm is graduated in the same manner, commencing from a point distant from the centre O half the length of the runner R . It is clear that the graduation, corresponding with the outer edge of R , will give the distance between the centre O and the axis of rotation of the sliding arm $y'Ry'$. The indicating instrument should be placed in a position having the clearest possible all-round view, and close to it should be fitted a voice tube in communication with the helmsman.

CHAPTER II.

THE EQUIANGULAR SPIRAL.

If we consider a group of radii proceeding from a point lying in the same plane, the curve originating at this point and which cuts the group of radii at a constant angle a , is the equiangular or logarithmic spiral. Let us put $\cos a = m$, and let us first find the equation to the curve, which will be useful for ulterior investigations. We refer to a system of polar co-ordinates having for pole the centre O , and for polar axis the line OA , proceeding from this centre, and which leads to the point we are considering. Let us indicate with ρ and ω (Fig. 1) the radius vector and the

Fig. 1.



argument for any point a of the spiral, with ds the differential of an arc of the same. Let b be a point on the curve infinitely close to a ; with centre O and radius ρ describe the infinitely small arc of the circle ac . The triangle acb , being infinitely small, may be considered both rectilinear and rectangular, in c we have

$$\frac{d\rho}{ds} = \cos a = m \quad (1)$$

whence

$$\frac{d\rho}{\rho} \frac{1-m^2}{m^2} = d\omega$$

Extracting the roots of both these equations, integrating, and indicating by L the Napierian logarithm we have

$$L\rho = \frac{m}{\sqrt{1-m^2}} \omega + \text{constant},$$

which, supposing that to $\omega = 0$ corresponds $\rho = OA = \rho_0$, becomes

$$L \frac{\rho}{\rho_0} = \frac{m}{\sqrt{1-m^2}} \omega \frac{\pi}{180} \quad (2)$$

Integrating (1) and observing that to $\rho = \rho_0$ corresponds $s = 0$ we obtain

$$\rho - \rho_0 = m s \quad (3)$$

From this relation we deduce that if two ships A and B move at a constant velocity V_A and V_B , which are in the proportion $\frac{V_B}{V_A} = m$; and if they start simultaneously from two points situated at equal distances from a point O , they will meet if one should follow with respect to O the logarithmic spiral for the angle α , such that $\cos \alpha = \frac{V_B}{V_A}$, whilst the other follows the radius vector OB . We have not here to occupy ourselves with this case; but it is to be noted that the spiral so considered is susceptible of application in the field of strategy. Let us suppose instead that a ship of velocity V_A follows with respect to O the equiangular spiral of inclination α ; and whilst this ship starts from a point A , another, with velocity V_B , such that $\frac{V_B}{V_A} = \cos \alpha$ moves from O along a determined direction, which makes with OA an angle Ω . Let us indicate with ρ and ω the co-ordinates of the point at which the faster ship is found at a given instant; and with R and Ω those of the slower ship at the same instant; by hypothesis Ω remains constant. We propose to consider how the distance r will vary between the two ships. We observe that $ms = R$; therefore calling r_0 the initial value of r from (3) it results that

$$\rho - r_0 = R \quad (4)$$

As at the moment in which the faster ship following the spiral passes ahead of the other $r = \rho - R$ we at once obtain from (4) the theorem which Admiral Fournier makes use of in his proposed tactics, based on this curve. The theorem states as follows: If two ships of speeds V_A and V_B ($V_A > V_B$) start at a distance r_0 , and the faster follows a logarithmic spiral, with its pole in the initial position of the slower, and inclined to the radii vectores at an angle, the cosine of which is $\frac{V_B}{V_A}$, whilst the slower ship follows any radius vector whatever, the distance between the two ships will vary until it becomes equal to r_0 .

when the faster will pass ahead of the other. In order to study this variation in distance, by the theorem of Carnot we get for any instant

$$r = \sqrt{\rho^2 + R^2 - 2 \rho R \cos (\Omega - \omega)}$$

which in virtue of (4) we may write

$$r = \sqrt{(r_0 + R)^2 + R^2 - 2 (R + r_0) R \cos (\Omega - \omega)} \quad (5)$$

and which naturally for the value $\omega = \Omega$ gives $r = r_0$, as we have already found. Substituting in this formula the value of ω which we get from (2) we obtain a solution of the proposed problem. To find the distance between the two ships after any time from the commencement of the enveloping spiroidal manœuvre, we must include in it the distance R run on the line by the slower ship, with the relative speed m and the data r_0 and Ω . What is of more interest for us is the limits between which the distance varies. The values of R , which gives the maximum and minimum of the distance r , must satisfy the equation

$$(2 R + r_0) [1 - \cos (\Omega - \omega)] - R \frac{\sqrt{1 - m^2}}{m} \sin (\Omega - \omega) = 0 \quad (6)$$

This equation becomes an identity for $\omega = \Omega$ to which we know $r = r_0$ corresponds; it is clear, therefore, that r_0 is a minimum; this will also result from simple geometrical considerations. Equation (6) may also be put into the form

$$(2 R + r_0) \operatorname{tg} \frac{1}{2} (\Omega - \omega) = R \frac{\sqrt{1 - m^2}}{m} \quad (7)$$

Assuming r_0 the value which we consider convenient as the mean distance for an artillery duel, for each value of $\frac{1}{m}$ can be found by trial the value of R for a given angle Ω taken from the bow of the slow ship. By R by means of (4) and (2), we get the corresponding value of ω , and therefore the maximum value r_m of the distance r by (5). We shall choose Ω approximately 40° , which is about the minimum angle, which will generally allow the greatest intensity of fire to be developed. Putting $r_0 = 3,000$ and making $\frac{V_A}{V_B}$ to vary between 1.1 to 1.5 the following results are obtained:—

$\frac{V_A}{V_B}$	Ω	R	r_m
1.1	$40^\circ 48'$	3849 metres	3435 metres
1.2	$41^\circ 48'$	2022 "	3210 "
1.3	$40^\circ 20'$	1362 "	3120 "
1.4	$40^\circ 12'$	1119 "	3090 "
1.5	$38^\circ —$	840 "	3060 "

To study the variation of distance which results from the spiroidal envelopment and to pronounce on its utility, it is necessary to find out: Firstly, in what manner it is possible to follow the spiral in an engagement between ships; secondly, the consequences that will arise if the faster ship fights on the principle enunciated by Admiral Fournier, and the slower ship endeavours only to obtain the maximum effect of her artillery. It is clear, since the pole is not visible, that we cannot make the ship describe this spiral by continual variations of her course; for the curve, therefore, we are obliged to substitute a rectilinear trajectory which may be equilateral or equiangular. Since in the first of these cases the course of the ship must vary according to a complicated law, we must have recourse to the second method, or that indicated by Captain Bajo in his "Reflections on actions between ships." To this conclusion we very early arrive, observing that by the equation of the spiral we perceive that if w increases in arithmetical progression, ρ will increase in geometrical progression. In virtue of this principle, Professor Lazzeri indicates a method of tracing this spiral by points (*Rivista Marittima*, 1896). If ρ , ρ_1 , and ρ_2 are radii vectores which satisfy this condition,

$$\frac{\rho_2 - \rho_1}{\rho_1 - \rho} = \frac{\rho_1}{\rho}$$

and, therefore, indicating by s , s_1 , and s_2 the arcs of the curve which correspond to them, starting from the origin we have the formula (3),

$$\frac{s_2 - s_1}{s_1 - s} = \frac{\rho_1}{\rho} \quad (8)$$

Further, for the same definition of the curve, the angle between two tangents is equal to that formed at the pole between the radii vectores which correspond to them. Let us consider the straight lines OA_1 , OA_2 , OA_3 . . . in a plane which proceed from the point O and form two and two a given angle w ; on OA_1 take a point A_1 at a distance r_0 from O , and draw the line A_1A_2 inclined at an angle a with OA_1 ; from A_2 draw A_2A_3 , making the same angle a with OA_2 ; similarly for A_3 , A_4 , and so on. It is clear that when w becomes infinitely small, from the rectilinear portions A_1A_2 , A_2A_3 , A_3A_4 we obtain an equiangular spiral. The angle between two successive sides is always w , the triangles OA_1A_2 ; OA_2A_3 , etc., are similar, and (8) also in this case holds good. The lengths of the sides in this case form a geometrical progression, the relation of which is $\frac{OA_2}{OA_1}$.

Captain Bajo, therefore, proposes that having fixed the value which the length of the first track A_1A_2 should have, and the angle a , we get from the triangle OA_1A_2 , in which we know $OA_1=r_0$, a and A_1A_2 the relation $\frac{OA_2}{OA_1}$ or the relation of the progression formed by the tracks A_1A_2 , A_2A_3 . . . etc., which the ship must pursue, and the angle w of the successive alterations of course; this in practice has the advantage that

If the slower ship follows a course inclined to the initial radius vector at an angle $\Omega = n\omega$ then

$$d_1 + d_2 + d_3 + \dots + d_n = d_1 \frac{\left(\frac{\sin a}{\sin(a-\omega)}\right)^n - 1}{\frac{\sin a}{\sin(a-\omega)} - 1}$$

and indicating the corresponding run of the slow ship by R'

$$R' = d_1 \cos a \frac{\left(\frac{\sin a}{\sin(a-\omega)}\right)^n - 1}{\frac{\sin a}{\sin(a-\omega)} - 1} \quad (10)$$

Denoting by r' the distance between the two adversaries when the faster ship passes ahead of the other, we have $r' = \rho'_n - R'$, or for the formulæ (10) and (9) d_1 being $= r_0 \frac{\sin \omega}{\sin a}$,

$$\frac{r'}{r_0} = \left(\frac{\sin a}{\sin(a-\omega)}\right)^n - \frac{\sin \omega \cos a \left[\left(\frac{\sin a}{\sin(a-\omega)}\right)^n - 1\right]}{\sin a - \sin(a-\omega)}$$

from which we deduce that $r > r_0$.

In fact, as identically

$$\left(\frac{\sin a}{\sin(a-\omega)}\right)^n - \left[\left(\frac{\sin a}{\sin(a-\omega)}\right)^n - 1\right] = 1,$$

it is sufficient to prove that

$$\frac{\sin \omega \cos a}{\sin a - \sin(a-\omega)} < 1,$$

which inequality may be written $\sin a (1 - \cos \omega) > 0$, and is always verified.

If $r_0 = 3,000$ metres; $\frac{V_A}{V_n} = 1.1$. For $\omega = 5^\circ$ and $\Omega = 41^\circ$ we have $n = 8.2$; whence by (11) we have

$$r' = 3,300 \text{ metres.}$$

The distance, which we obtain analytically by means of Carnot's theorem, reaches in this hypothesis the maximum value of 3,650 metres.

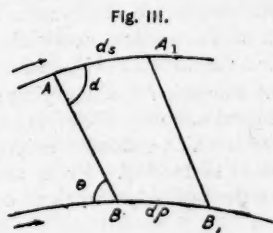
From our study of the question up to the present we conclude:—(a) That if two ships A and B , of speed V_A and V_n ($V_A > V_n$), start at a distance r_0 , and the faster follows an equiangular course with its pole in the initial position of B , and inclined to the radii vectores at an angle the cosine of which is $\frac{V_n}{V_A}$, whilst the slower ship follows a radius vector inclined to the initial one at an angle Ω , which differs little from 40° , the distance between the two ships will increase and then diminish, until A closes and

crosses the course of *B*. The maximum variation in the distance is not very great. If the angle between the successive parts of the course be made infinitesimal, the polygonal line becomes a logarithmic spiral, and the maximum distance will vary very little from the original value. We have arrived at this result by analysis. Plate 7 confirms it graphically, but does not coincide with the results obtained by Messrs. Tournier, La Porte, and Coton in their "Study of the movements of ships in action," *Revue Maritime*, August, 1896.

(*b*) To follow the logarithmic spiral we need the help of the Indicator, a table from which we can obtain the time necessary to cover a certain distance at a given speed, and a watch. Admiral Fournier writes that when a squadron wishes to take advantage of its superior speed to engage the enemy at a distance, preventing the latter from approaching within the determined limit of safety whatever course he may follow, the squadron should be disposed in line ahead; and from the moment of arriving at the head of the enemy's line at the established distance, should commence to describe around him an arc of a logarithmic spiral having this initial position as the pole. The illustrious admiral *supposes that the slower squadron will keep on a straight course until he sees his opponent pass ahead of him*; and then, seeing the distance increase will change course to follow a new convergent direction to close again. The faster opponent will then find himself obliged to repeat the preceding manœuvre. Assuming as the pole the position of the inside squadron at the moment of reaching the minimum distance; repeating the same conjugate manœuvres, the trajectory of the enveloping squadron will be a succession of identical spiral arcs, each equally inclined to the new initial radius, and agreeing the one with the other by their common tangents. The trajectory of the slower squadron will be a polygonal line; this line will become a circular curve, if the leader of the squadron should manœuvre so as to keep the ship heading for the leader of the enemy's formation; then the spiroidal arcs described by the latter would constitute a circular course concentric with the former. We shall occupy ourselves now with single ships, and not with squadrons. Verifying the facts foreseen by Fournier, in the best possible conditions, since we have seen it to be necessary to substitute for each spiroidal arc a straight track, the distance will increase with the changes of the pole, and the envelopment will no longer fulfil the double object of maintaining the distance and the angle of incidence of the projectiles within narrow limits. If the combatant with the higher speed follows the conceptions of Admiral Fournier, what will be the most rational manœuvre for the slower, or that of the greatest utility? Let us admit that at the commencement of the fight the faster ship *A* will describe an arc of a spiral, whilst her adversary *B* will attempt to diminish the distance between them as much as possible. After a time *B* will be convinced that it is not possible for her to succeed in her attempt. Constrained to action at a distance, the slower ship can only propose for herself one object—that of maintaining the enemy under the minimum angle with the line of keel which permits of the development of the

maximum intensity of fire. The problem of the spiroidal envelopment presents itself then under the following form:—To find the variations of distance and bearing between two ships *A* and *B* of speeds V_A and V_B ($V_A > V_B$), which start from a distance r_0 , and of which *A* follows a logarithmic spiral with its pole in the initial position of *B*, and inclined to the radii vectores at an angle the cosine of which is $\frac{V_B}{V_A}$, whilst the ship *B* manœuvres maintaining *A* under a constant bearing θ . We take the angle θ from the stern of *B*. This problem, which occurs in the general case in which *A* follows any curve whatever, is very difficult of solution, which we shall show later. Meanwhile, from Plate 7 we perceive that in the hypothesis of the spiral *Aa* ($\frac{V_A}{V} = 1.1$; $r_0 = 3,000$); and for $\theta = 139^\circ$, the distance becomes 3,400 metres, the spiral cuts the radius vector *Ba* so that $\Omega = 41^\circ$.

We observe that, whilst the ship *A* is obliged to substitute for the spiral an equiangular course, it is easy for *B*, by means of simple sights, to follow the corresponding curve of the nature of *Bb*, or the succession of arcs of the curve which results from maintaining under a constant bearing a ship following a rectilinear course. The distance between the two ships will thus suffer continual variations; the ship *A* will never pass ahead of her adversary, and we cannot understand what will be the advantages which she will gain by her manœuvre; it is, therefore, necessary to seek for modes of action more adequate to the ends we wish to arrive at. From the preceding considerations we derive an idea from which we shall obtain other suggestions fruitful of practical results: to make the ship *A* maintain her adversary under an angle the cosine of which is $\frac{V_B}{V_A}$. In general terms, the problem which we have to study presents itself thus: To find the variations of distance between two ships *A* and *B*, with speeds V_A and V_B ($V_A > V_B$), and which have bearings with respect to each other the constant angles α and θ , taken the one from the bow of *A* the other from the stern of *B*. In (Fig. 3) *A* and *A*₁ are two positions of *A* infinitely



near each other, *B* and *B*₁ the corresponding positions of *B*. Indicating by ds the differential of an arc of the curve of *A*, and by $d\rho$ the run of *B* in an infinitesimal period, we have $AA_1 = ds$; $BB_1 = d\rho$. Calling dr

the differential of the distance r and projecting the lines A_1AB and BB_1A_1 on AB we get

$$r - ds \cos a = r + dr - d\rho \cos \theta,$$

from which, observing that $ds = d\rho \frac{V_A}{V_n}$

$$dr = d\rho \left(\cos \theta - \frac{V_A}{V_n} \cos a \right)$$

since to $\rho = 0$ corresponds $r = r_0$, integrating we have the formula

$$r - r_0 = \rho \left(\cos \theta - \frac{V_A}{V_n} \cos a \right) \quad (11)$$

which solves the problem proposed.

If $\theta = 180^\circ$, or if B keeps her head constantly on A (11) becomes

$$r_0 - r = \rho \left(1 + \frac{V_A}{V_n} \cos a \right),$$

from which we perceive that on this hypothesis of $a = 90^\circ$, whatever value $\frac{V_A}{V_n}$ may have, $r_0 - r = \rho$, where r is zero when $\rho = r_0$. We may consequently affirm that if a ship A manœuvres to maintain another B on her beam, and if B keeps her head constantly towards A , the ships will meet when B has traversed a space equal to the initial distance r_0 .

In the spiroidal evolution and in the supposition that B keeps a straight course, at the instant in which the ship A cuts the course of B , the bearing of her bow is the angle whose cosine is $\frac{V_n}{V_A}$; if whilst B maintains A under the angle θ this condition of bearing is to be always verified, we must substitute $\frac{V_n}{V_A}$ as $\cos a$ in (11), and in this way we obtain

$$r - r_0 = \rho (1 + \cos \theta) \quad (12)$$

from which we see that the distance is always increasing if θ differs from 180° . The rapidity of these variations is considerable; for $\theta = 140^\circ$, $V_n = 10$ miles, $r_0 = 3,000$ metres, we obtain after 22 minutes $r = 4,680$ metres. From the idea of the tactical application of the logarithmic spiral we have established the formula (11), and although not admitting, for the reasons given, the convenience of applying the theory of Admiral Fournier, and the consequent methods of carrying it out by Captain Bajo, from (11) we have a result which conducts us into a new field of ideas, and which we shall proceed to develop. From that formula we perceive that the distance between the two ships remains constantly equal to the initial distance when

$$\cos a = \frac{V_n}{V_A} \cos \theta \quad (13)$$

This, generalised, is the fundamental formula for the theory of combat at a constant distance.

CHAPTER III.

THE PROBLEMS OF THE PURSUIT.

Admiral Fournier writes:—"The methods of pressing an enemy surprised on the coast as closely as possible when he has no longer a free field in all directions to avoid his assailant, and inversely the choice of the most defensive route one ought to follow in a similar case in order to be cannonaded at the greatest possible distance, must form one of the most important chapters of our tactics; for there will be a daily application of them in time of war in the narrow seas of Europe, where encounters will generally take place along the coasts." Two problems of the highest importance, therefore, offer themselves for our consideration; we shall show that there exists a solution of them, by the Cinematic Indicator, simple, practical, and easily applicable at sea.

Problem I.—A ship A moves with constant speed V_a on a straight line r . We require to know, firstly, in what direction another ship B with constant speed V_b must move to arrive in the least possible time at a distance d from A , supposing the initial distance AB known, and the angle r makes with the line AB ; secondly, in the case where this is impossible, what is the direction in which B must move to arrive at the minimum distance from A .

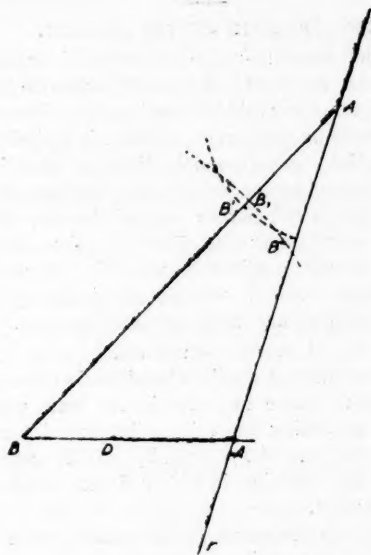
Let us indicate by a the angle which r makes with BA , by D the initial distance AB , and put $\frac{V_a}{V_b} = m$; $\frac{D}{d} = n$. If r coincides with AB , or if $a = 0^\circ$ or 180° , it is clear that B must move on AB . If r does not coincide with AB , we must distinguish three cases according to whether $n > 1$, $n = 1$, or $n < 1$.

Theorem.—If A' , B' are the positions of A , B when they have arrived at a distance d in the least time possible, the three points A' , B' , B are in a straight line. (Fig. 4.) Let us suppose $n > 1$, or $D > d$. Admitting that B' is at B'' , that is, not on the line joining BA' , and that B_1 is the point of intersection of this line with a circle having centre B and radius BB'' . It is clear that BB' is less than BB_1 . If, therefore, the ship B had followed the route BB'' , she would have reached from A a distance less than d in a time equal to that occupied in covering BB'' . From this there would exist a position of A intermediate between those we have considered, and corresponding to the shortest route for B , of which the problem treats; or BB'' would not be the shortest run. To this absurdity we always arrive, except in the case in which B' is on the line BA' ; the alignment mentioned is therefore necessary. We may observe also that such a reasoning holds equally good if we treat of the distance d as the minimum obtainable; and it is easy to see that in a similar manner we arrive at the same result of $n > 1$.

Corollary.—If A follows any curvilinear course whatever, and A' , B' are the positions of A , B when they have arrived at the distance d

in the least time possible, the three points A' , B' , B are in a straight line.

Fig. IV.



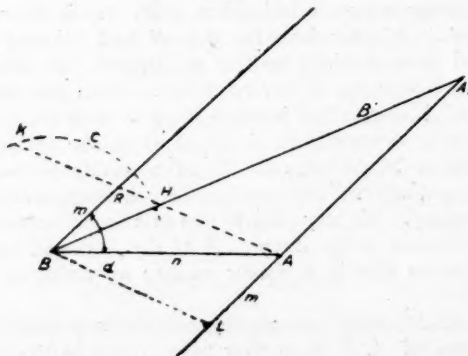
The demonstration is the same as before. The problem proposed is thus reduced to the following:—

To construct a triangle ABA' knowing an angle $A=a$, side $AB=D$, and that the side AA' is divided at a point B' in such a way that we have

$$\frac{AB}{A'B'} = \frac{D}{d} = n; \quad \frac{AA'}{BB'} = \frac{V_A}{V_B} = m.$$

First Case.—Suppose $n > 1$ or $D > d$. On the sides of an angle equal to a (Fig. 5) take $BR = m$, $BA = n$; with centre B and radius 1 describe

Fig. V.



a circle c . It may cut the line AR in two parts, H and K , situated on the same side of A , BA being greater than BH because $n > 1$. If BH meets AA' in a point A' , we obtain a triangle ABA' in which

$$\frac{AB}{BH} = \frac{n}{1} = n.$$

From B drawing BL parallel to AR to meet AA' we get $AL = BR = m$ and from Talete's theorem

$$\frac{AA'}{HA'} = \frac{LA}{BH} = \frac{m}{1} = m.$$

Taking, therefore, on $A'B$ a segment $A'B' = BH$, we have also $BB' = A'H$ and therefore

$$\frac{AB}{A'B'} = n \frac{AA'}{BB'} = m.$$

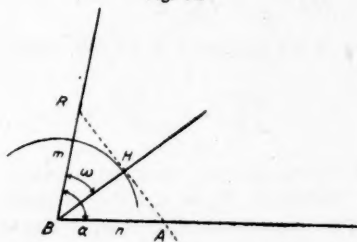
The angle RBA' gives us the direction in which B must move to solve the problem proposed. If $m < 1$ the distance of the line AH from B , which is equal or less than $BR = m$, is less than 1, or than the radius of the circle c , and consequently we have two points of intersection, H and K of c and AH , situated on the opposite sides of BR , and one only of the lines BH, BK intersects AA' . We have then the only solution. If $m = 1$ the distance of AR from B is less than or equal to m , according as AR is oblique or perpendicular to BR . In the first case, one of the lines BH, BK is parallel to AA' , the other meets the line AA' if the angle BLA is acute, and does not if it is obtuse. If the angle BLA is a right angle, the points H and K coincide and BH becomes parallel to AA' . Hence we have one or no solution. If $m > 1$ the circle c may be external, tangent, or secant to AH . In the first case no solution exists. In the second case there exists one or none, according to whether the radius which passes through a point of contact intersects or not the line AA' . In the third case, the two points H, K are on the same side of BR , and these both intersect or do not intersect r . We have, then, one or no solution, because in the case of the intersection of the two routes we must choose the lesser. Recapitulating, we can say: The problem is always possible if $m < 1$; if $m = 1$, the problem is possible provided that ALB be less than a right angle; if $m > 1$ so that the problem may be possible, it is a necessary, but not a sufficient, condition that AR intersects the circle c at least in one point. Hence the minimum value possible of the distance d , which is represented by BH , we have when AH is perpendicular to BH . The second part of the problem proposed is therefore solved in the following manner. Not knowing d we cannot assume it as the unit of measure; let us refer to any unit whatever. On the straight line BR (Fig. 6) take $BR = m$; with centre B describe a circle with radius 1, and from the point R draw a tangent to the circle. The angle ω , formed by the radius BH which passes through the point of contact, and the line BR , is that which the course

of B must make with that of A to arrive at the least distance in the shortest time. This angle is given by the relation

$$\cos \omega = \frac{1}{m} = \frac{V_B}{V_A}$$

To find the minimum distance at which B arrives following BH it is sufficient to trace BA so that the angle $RBA = a$. If H is external to the angle RBA the point B cannot arrive at a distance from A less than the initial distance D .

Fig. VI.



2nd Case.—If $n = 1$, or $D = d$, it is evident that the two ships will find themselves in the required conditions at the beginning of the manœuvre.

3rd Case.—If $n < 1$, or if $D < d$. It is easy to see that the problem is solved as in the case $n > 1$; only $BA = n$ (Fig. 5) must be taken at the opposite side of A . n can be also taken on A , but $BR = m$ must then be taken in the direction contrary to the motion of A . The discussion is perfectly analogous. Treated thus geometrically in a general and complete manner, it is easy to see that the problem of the pursuit can be solved at sea by means of the Cinematic Indicator.

A ship B wishes to place herself at a determined distance d from another ship A ; the courses are optional, the relation between the speeds $\frac{V_A}{V_B} = m$, that between distances D and $d = n$. The course of A is constant. On the ship B the directing arm QQ' is fixed parallel to the direction of A 's course; (Fig. 7.) the bearing of A is taken by means of the bearing arm Ox and the sliding arm is moved along until the reading on the bearing arm $OR = n$; the arm yRy' is rotated so as to cut the index of direction, in OQ or OQ' according as n is greater or less than 1, at a point P , such that $OP = m$. yRy' cuts the circle BBB at a point M towards the ship A , and the angle ZOM , which we read off, is the required angle of approach. If the problem is not possible from what we have said on this point, we see how to obtain the course B should follow so as to arrive in the shortest possible time at the minimum distance from A . Fix the arm QQ' parallel to the direction of A ; then, by the aid of the graduated arc or of the circle, the bearing arm is set at right angles to the sliding arm. Moving yRy' parallel to itself, until we read off Ox , the graduation

B may reach the desired distance d from A before the latter arrives at A_1 ; and then the solution is that indicated; or the line By , the direction of B 's course in the preceding hypothesis, cuts the course AA_1X at a point in A_1X . By the theorem on the alignment of the initial position of A , and of A and B when B arrives at the distance d in the least time (which we have said holds for any course whatever of A), we easily deduce that the movement of B must take place on a single straight line, and not on a changing course. From A_1 in a direction opposite to A_1X , draw the segment $A_1A' = A_1A$. It is evident that the direction BF' , in which B must move to solve the problem, is obtained by supposing that the movement of A is always along A_1X and A' is the initial position of A . Let us imagine now a course $A_1A_2A_3A_4 \dots X$ to be the trajectory of A . If, from the geometrical construction it results that B cannot arrive at a distance d whilst A is on the course AA_1 (or, in Fig. 8, if A_1 is inside the angle ABY) from A_1 make $A_1A' = A_1A$. If it still results that A_2 is inside the angle $A'BF'$ (A_1Y' being the direction of movement of B for the straight line $A'A_2$), make on A_2A_3 , in a direction opposite to that of the movement, $A_2A'' = A_2A' = A_2A_1 + A_1A$. In the same manner, continue to a point A_n which is not inside the angle $A^{(n-1)}By^{(n-1)}$; $By^{(n-1)}$ is the diameter required by the problem. If the movement of A is on a curve, it will be the preceding case, substituting for the curve a rectilinear course with the sides sufficiently small. We shall later on study the application of these results.

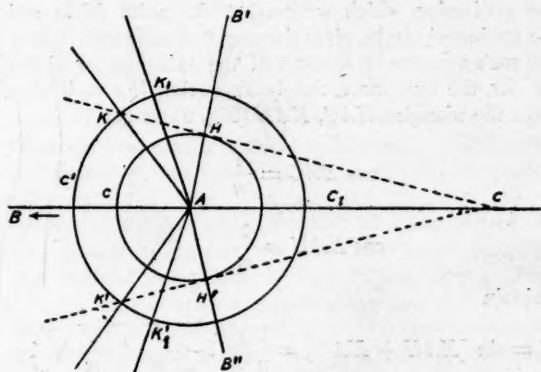
Problem II.—A ship B , with speed V_n , manœuvres so as to arrive in the least possible time at a distance d from a ship A which has a speed V_A ; if A is obliged to move within a determined sector of angular dimensions θ , find the course that she must take to prevent B from attaining her object; or if that is not possible, that B should take the maximum time in doing so. Indicating by D the initial distance between the two ships, put as usual $n = \frac{D}{d} \frac{V_A}{V_n} = m$. By hypothesis $n > 1$;

we must then consider three cases in which m may be ≥ 1 .

1st Case.—Let us suppose $m > 1$ or V_A greater than V_n . The question is solved in a very simple way, remembering what was said in Problem I., by the following geometrical construction. On BA opposite to B take $AC = n$. With centre A describe the two circles c and c' , the inner with radius 1, the outer with radius m . The tangents to c from the point C cut the circle c' in the points K and K' . It is clear (Problem I.) that if A follows the route AK , or the other AK' , the least distance to which B can arrive will be d . B will obtain this by a course parallel to AB' in one case, and to AB'' in the other. If A follows any course whatever outside the angle KAK' , the minimum distance at which she will pass from B will be greater than d ; we can therefore fix a limit h of safety, and then the problem is reduced to finding the direction which A should take so that the minimum distance at which B could

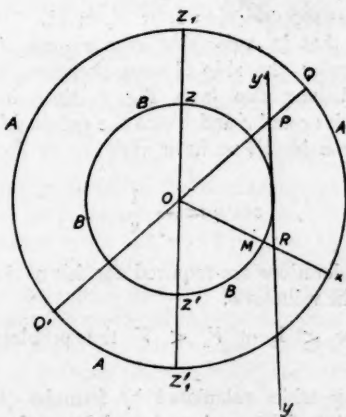
arrive would be $d + h$. This direction is evidently obtained from Fig. 9, taking in it $\frac{D}{d+h}$. We have thus the point C_1 and the two routes which A can choose are AK_1, AK'_1 . If $\theta > K_1 AK'_1$ the problem then admits of two symmetrical solutions with respect to the line AB , if both the lines AK_1, AK'_1 are inside θ . If the line AB coincides with the

Fig. IX.



bisectrix of θ the choice is indifferent; otherwise it is clear that A should prefer the direction which makes the greatest angle with the other limiting line of θ . If $\theta < K_1 AK'_1$ then A should follow that of the two limiting lines of θ which makes the least angle with AK_1 or AK'_1 . The indicator instrument gives as usual the practical means of solving the problem. Put $d + h = d'$.

Fig. X.



On the ship A arrange (Fig. 10) the arms QQ' and Ox in the same vertical plane, then take the bearing of B with the bearing

arm. Fix QQ' with the screw and by traversing the runner R read $OR = m$; by rotating it on its axis make the groove of the sliding arm tangent to the graduated circle of the instrument, *from the side where there is the largest extent of free water*. It is clear that by rotating the bearing arm until $y'Ry$ cuts on the arm of direction a point P when

$OP = n = \frac{D}{d'}$ we construct to scale the triangle KAC of Fig. 9, and consequently the graduation which we read at the point M , in which Ox intersects the graduated circle, gives the angle of approach. Not being able to follow such a course on account of the existence of obstacles in the direction Ox , the one most closely approximating to it should be chosen. From the triangles HAC , KAH (Fig. 9) we get

$$\cos HAC = \frac{1}{n}$$

$$\cos KAH = \frac{1}{m}$$

whence we obtain

$$\sin KAC = \sin [KAH + HAC] = \frac{1}{n} \sqrt{1 - \frac{1}{m^2}} + \frac{1}{m} \sqrt{1 - \frac{1}{n^2}}$$

or

$$\sin KAC = \frac{1}{mn} (\sqrt{m^2 - 1} + \sqrt{n^2 - 1}) \quad (1)$$

in which, making $n = \frac{D}{d'}$, we deduce $180^\circ - KAC = BAK$, which we shall indicate by γ .

2nd Case.—Let us suppose $m = 1$, or $V_A = V_B$. We have seen in Problem I. (Fig. 5) that in order that B may meet A , ARB must be less than a right angle; the ship A must, therefore, make ARB equal to 90° . This we deduce also from Fig. 9, since in the case under consideration the circles c and c' and hence the points H and K coincide. Substituting unity for m in (1), we have

$$\cos \gamma = -\frac{1}{n} \quad (2)$$

Analogous considerations are required for this as for the preceding case with regard to the value of θ .

3rd Case.—If $m < 1$, or $V_A < V$ the problem admits of no solution.

In the following table, calculated by formulæ (1) and (2), n is made to vary from 1.4 to 2.8, a and m from 1.0 to 1.5. In this way we get an idea of the values which the angle γ can assume within practical limits.

VALUES OF γ .

$m \backslash n$	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8
1.0	136°	129°	124°	124°	117°	115°	113°	111°
1.1	111°	104°	99°	95°	92°	90°	88°	86°
1.2	102°	95°	90°	86°	83°	81°	79°	77°
1.3	96°	89°	84°	80°	77°	75°	73°	71°
1.4	92°	85°	80°	76°	73°	71°	69°	67°
1.5	88°	81°	76°	72°	69°	67°	65°	63°

"Whatever may be the tactical difficulties of the blockade," writes Mahan, "strategical necessity imposes on us diligent study in order to overcome them."

By means of the deductions to which we have arrived in treating of the two problems of pursuit, we may attempt to solve the problem of the local blockade considered under a tactical aspect. Let us suppose at first that a ship B wishes to prevent a ship A from coming out of port. B is more powerful than A , and the latter is obliged to seek the fastest method of getting out and avoiding an engagement. The fact that B does not force the passage indicates that it is defended; let D be the distance from the entrance at which B maintains the blockade during the day, that is the vertex of the sector θ in which A can manoeuvre; the limits of θ are constituted by the obstacles of the coast. When A attempts to force the blockade her object is not to approach within a distance d of the enemy, at which her artillery will be effective; the object of B is the reverse of this. We may take $d = 3,000$ metres. The cases generally to be considered are three, according as $V_A \gtrless V_B$. In

the first case the possibility of the problem that A has to solve depends, as we already know, on the angle which the line joining with B and the vertex of the sector makes with the limiting lines of the latter, and on the values of the relations $m = \frac{V_A}{V_B}$ and $n = \frac{D}{d} = \frac{D}{3000}$. From this arises the necessity for B to find herself at the commencement of the manoeuvre in the position which gives the greatest advantage to the enemy.

Let us suppose $m = 1.3$ and $\theta = 120^\circ$. It clearly results from the tabular value of γ that the ship B , even under the favourable conditions of being able to maintain a relatively small distance from the enemy's fortifications, cannot follow one of the limiting lines of the sector, otherwise the adversary would have her escape assured. In the hypothesis we are considering the best position of B is therefore on the bisectrix of θ ; and then all depends on the value of D according to whether this makes $\gamma > 60^\circ$ or no. D being, for example, 8,000 metres, gives $n = 2.7$ and $\gamma = 72^\circ$. It is clear, therefore, that if B moves on the bisectrix and maintains a distance from the enemy's fortifications of from 8,000 to

9,000 metres the escape of *A* is not possible. This ship, therefore, should attempt to force the blockade at night, keeping as close as possible to the coast, hoping to be protected by the darkness and seen too late by *B*. It may happen, however, through the particular configuration of the coast, *A* in maintaining her distance from it may be obliged to describe a course which we may consider as two sides, because for the values generally assumed for *D* the forcing ship is reached whilst these first two sides are being run, or she succeeds in her attempt. In any case, the method in which *B* should use the instrument is that of Problem I., only it must be supposed that the initial position of *A* (Fig. 8) is on *A'*. The bearing of *A* can be determined from the ship *B* at the commencement of the blockade. For $m = 1$ the conditions for *A* become worse; and finally, for $m < 1$ it is impossible for the ship blockaded to escape if seen by her enemy.

We are considering only the tactical problems which are presented; it is in fact recognised that a ship in the preceding conditions cannot remain long before a port in which the enemy lies, so that in reality she is not sufficient to prevent her opponent from putting to sea. If we imagine homogeneous forces opposed to each other, rather than single ships, analogous conditions to the above might occur. With regard to the value of speed relations, there are usually three cases to examine. Let us indicate by *B* the blockading force, and by *A* the blockaded, by V_b and V_a the maximum speeds respectively. The arrangements of the ships *B* must admit of the greatest number of units attacking the ships *A* as soon as they appear, with their artillery. If $V_a > V_b$ it may be that the extent of the angle θ in which *A* can act is such that a ship on the point of the bisectrix at a distance *D* from the entrance of the port might reach a ship *A* moving on a limiting line of the sector. In this case it is natural that it will be convenient for *B* to be grouped on the bisectrix in question during the day. If θ is such as not to admit of the previous manœuvre the ships *B* must divide themselves into three groups, of which two should be on the limiting lines of the sector and one on the bisectrix of the same; and as generally speaking it will not be possible for a group to receive any help during the action, the tactical value of each of the three should at least equal that of the enemy. By night, maintaining the fundamental idea of this disposition, it is necessary that the ships *B* should form a chain and diminish the distance *D* so as not to sight the enemy too late. If $V_a = V_b$ it will generally be sufficient, for ordinary values of θ , for the ships *B* to remain on the bisectrix of the sector; and, finally, for $V_b > V_a$ it is clear that *B* are pretty free in their movements. In general the forces of *B* will be constituted of divisions not homogeneous amongst themselves, but each composed of homogeneous units; evidently the ships which have a speed very inferior to the probable speed of *A* must be disposed on the limiting lines of θ , those for which the relation $V_a : V_b$ would approximate to 1 should be disposed on the bisectrix. If at the instant of forcing the blockade the ships *A* separate into groups, a similar manœuvre is imposed on *B*; let us repeat the rule enunciated by Nelson:—"The rule for the pursuit is to keep station only so far as

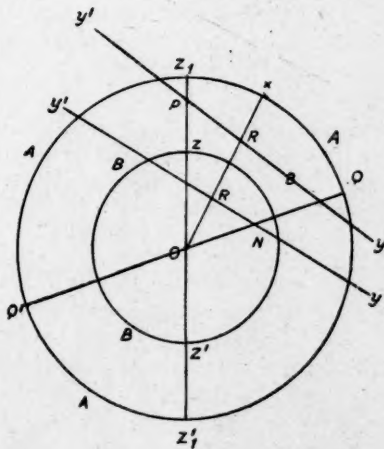
not to allow the faster ships to get so far ahead of the slower ones as to be altogether out of touch. The latter should be able to arrive to the help of the former before they can be separately defeated." By night the naval force B will necessarily be formed in chain; and, therefore, as it will not be possible to diminish the distance from the entrance to the port, the difficulties of bringing together a sufficient number of ships to go into action, together with the probability that the ships forcing the blockade will not be soon discovered, the advice to A is to make the attempt at night. Concluding, we may say that the geometrical solutions of the two problems of pursuit treated of give an easy and safe method for the study of the blockade of a naval force in a fortified port, or for forcing the same; in these operations also the great advantages of speed are brought out. We shall now solve two problems which have strict analogy with those already discussed.

Problem III.—To determine the distance between two ships which follow rectilinear courses with constant speed when one passes ahead of the other. Let A and B be two ships, V_A and V_B their respective speeds. Let A be the first to arrive at the point where the courses cross each other. Let us put

$$m = \frac{V_A}{V_-}; \frac{D}{d} = n,$$

D being the initial distance and d the unknown distance of the problem. Evidently the geometrical construction is the inverse of that of Problem I. Supposing in Fig. 5 the direction BR and BH being fixed, we obtain $BA = n$. On the ship B (Fig. 11), take bearing of A in

Fig. XI.



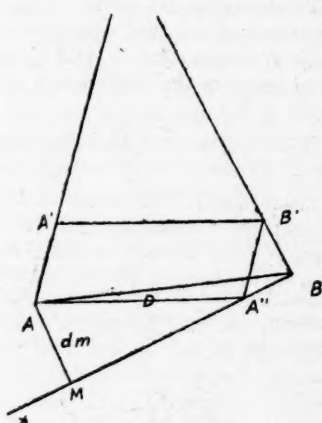
the manner indicated in Problem II., and arranging the arm Ox parallel to the course of A . Move the sliding arm so as to cut (on Ox) $OR = m$, taken in the direction of movement of A ; then rotate

$y'Ry$ so as to pass through the point Z of the diameter ZZ' , or through O° . The point P the intersection of the arm $y'Ry$ with QQ' gives the length $OP = n$. The case represented by Fig. 11 is that of $d > D$, see Problem I.

3rd Case.—On the ship A , to make the analogous construction, take bearing of B by means of QQ' , place Ox parallel to the route of B ; move the sliding arm so as to read $OR = 10$, and rotate it so as to cut on OZ , the graduation m . The intersection of $y'Ry$ with QQ' gives the point P . If the ship B is the first to arrive at the crossing point, we must put $m = \frac{V_n^*}{V_A}$.

Problem IV.—To find the minimum distance between two ships A and B which follow rectilinear courses, with constant speeds V_A and

Fig. XII.

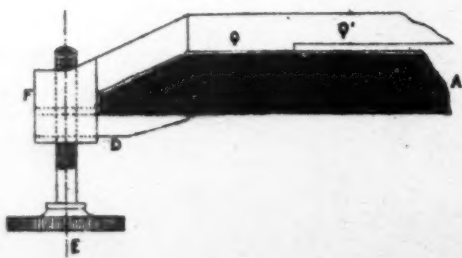
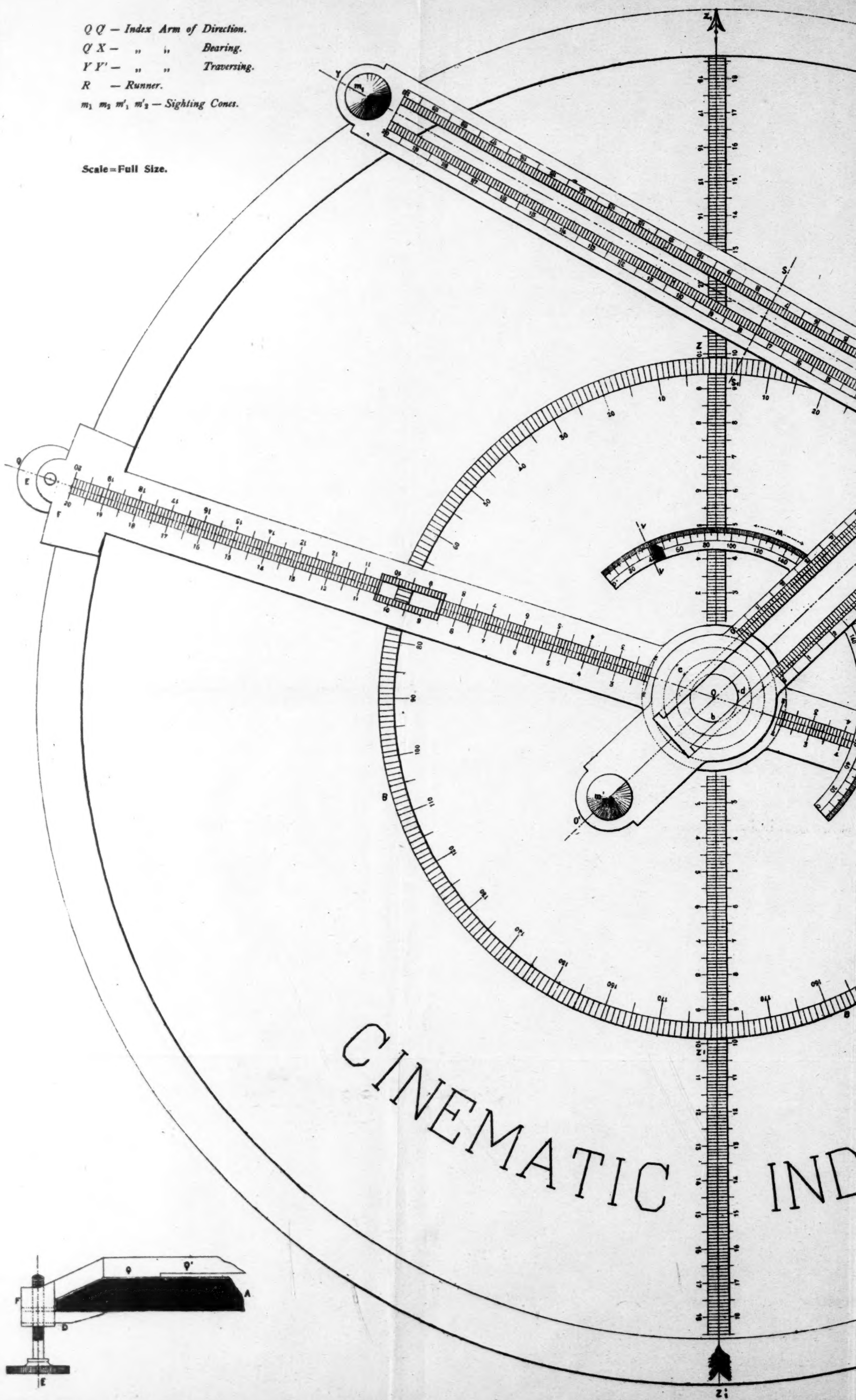


V_B , their positions at any moment being known. Let D be the distance AB between the two ships at the instant under consideration. Let $A'B'$ be two successive and simultaneous positions. From the point B' draw $B'A''$ equal and parallel but in the opposite direction to the course AA' of A . Joining A'' with A we get $AA'' = A'B'$, being the movement of A and B , the points A'' become displaced on the line BX , which can be evidently obtained by taking $BB' = V_B$ and $B'A'' = V_A$. The distance between the two ships at any instant will be that corresponding to that of A'' from A and the perpendicular AM , which expresses the minimum distance of BX from A will therefore be the value of d_m , the least distance at which the ships A and B pass one another. This can also be expressed by saying that if we trace from B the index of the relative movement, the perpendicular let fall upon it from

* It may well happen that the minimum distance d_m may not be verified at the crossing point of the course; this indicates that the ships have not arrived at this distance in the least possible time.

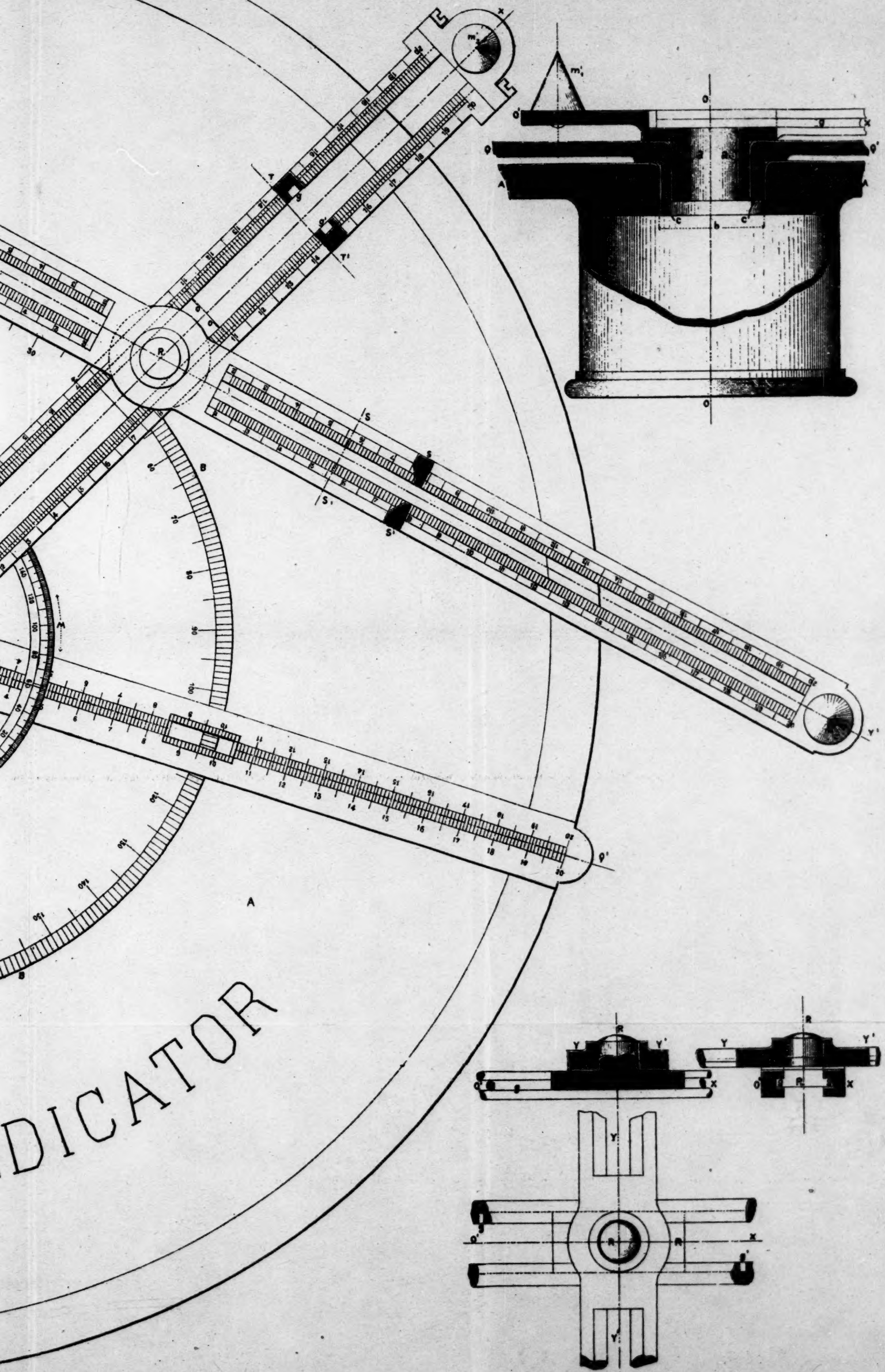
$Q Q$ - Index Arm of Direction.
 $Q X$ - " " Bearing.
 $Y Y'$ - " " Traversing.
 R - Runner.
 $m_1 m_2 m'_1 m'_2$ - Sighting Cones.

Scale=Full Size.



SPEED IN NAVAL TACTICS.

DIAGRAM I.



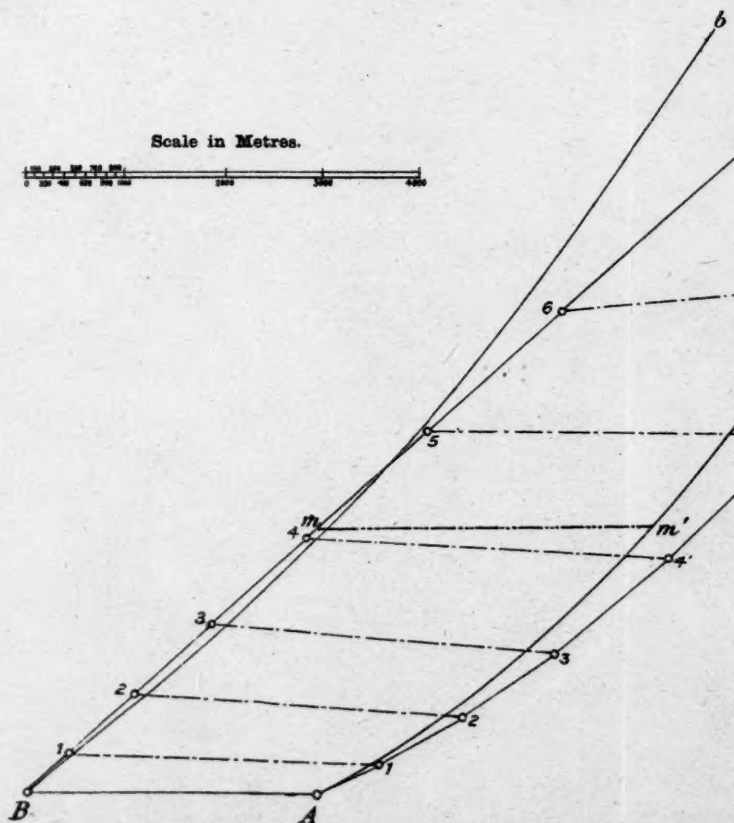
SPEED IN NAV

DIAGRA

Logarithmic Spiral $\frac{V_A}{V_B} = 1, 1. \Omega = 41^\circ$ —initial distance $BA = 3000$ m.
—maximum distance $m m' = 3400$

1'2'3' . . — *Equiangular trajectory.*

B b — *Curve of constant bearing (41°) and speed V_B with respect to Spiral A*



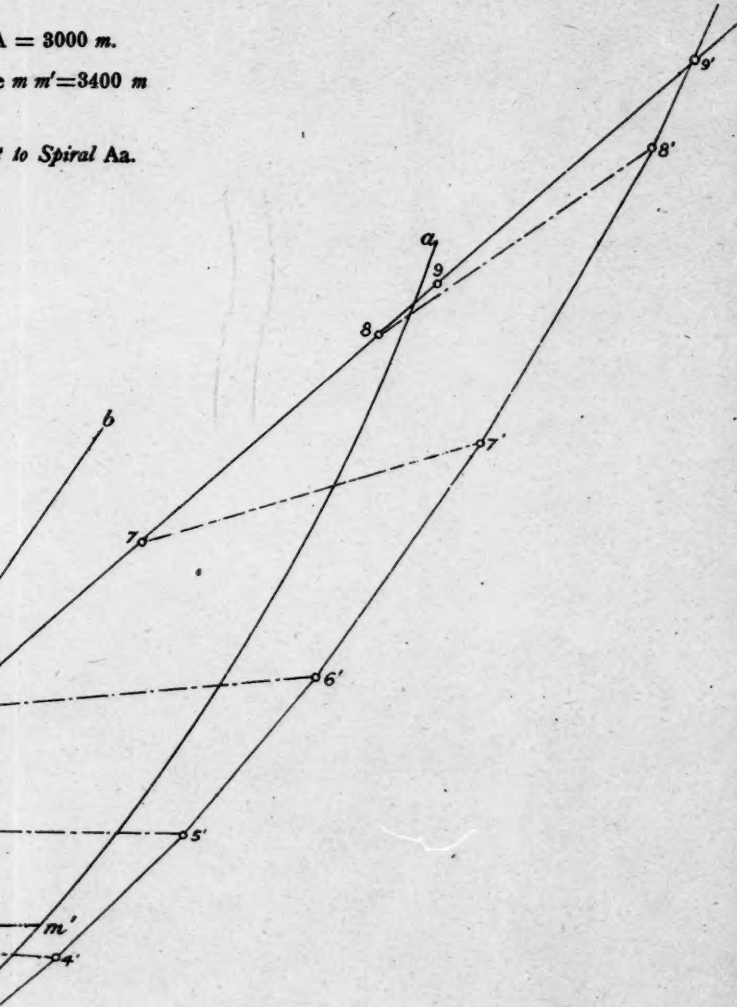
D IN NAVAL TACTICS.

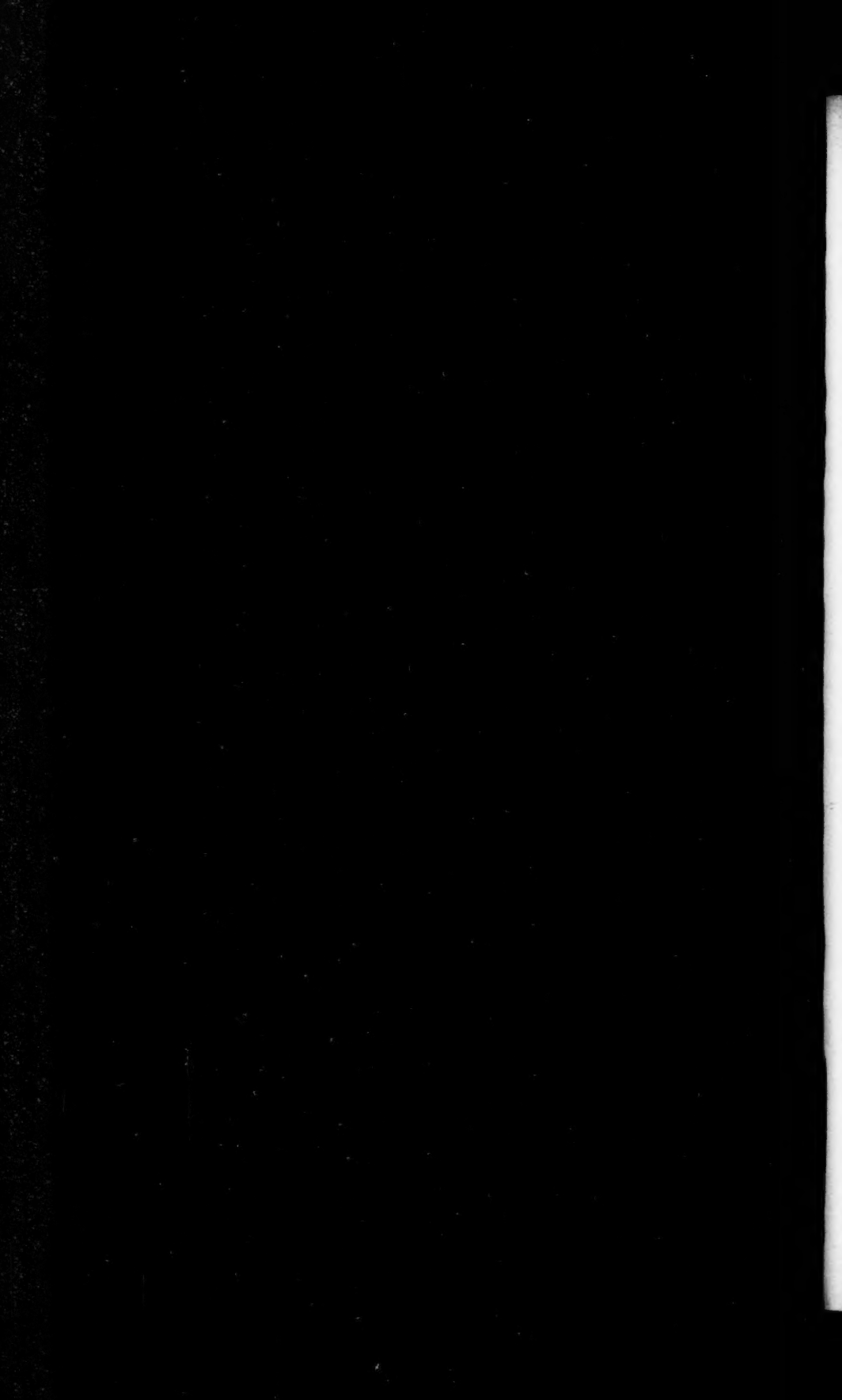
DIAGRAM II.

$A = 3000\ m.$

$m\ m' = 3400\ m$

to Spiral Aa.





VON LÖBELL'S ANNUAL REPORTS ON THE CHANGES AND PROGRESS IN MILITARY MATTERS IN 1899.

Précis by Lieut.-Colonel E. GUNTER, p.s.c. (late East Lancashire Regt.).

PREFACE.

THIS volume of 556 pages includes, as the Editor says in his Preface, the reports for the later months of 1898, as well as those for 1899. Owing to the voluminous nature of the Jubilee number of 1898, it was necessary to go to press before all the reports for that year were edited. Some changes in detail which occurred in 1898 are, therefore, inserted in the present number.

The reports on the Armies of the Great Powers are placed in alphabetical order for easy reference, a brief tabular summary of those of France and Germany being given, so as to show concisely the military organisation and strength of these leading military Powers in 1899, while those of Russia, Austria, Italy, and others are also shortly epitomised, which is all the space available in the JOURNAL allows.

The Report does not include any account of the Japanese or Chinese Armies. An epitome of the latter was, however, given in the JOURNAL for June, 1898. A summary of the account of "The Progress in Tactics and Weapons" in Part II. and of the Historical Section in Part III. has been given, but it was impossible to do more than glance at the report on the military literature of the year. The criticism on the Boer War is in the Historical Section.

Foot-notes marked with daggers are by the Editor; those indicated by asterisks are by the Translator.—E. G.

PART I.

Extracts from the Reports on the Organisation, Strength, Equipment, Training, etc., of the Armies of Individual States, 1899.

AUSTRIA-HUNGARY, 1899.

There are 15 Regular Army Corps, which include 31 Infantry and 5 Cavalry Divisions. These include:—

Infantry.—70 brigades, 110 regiments, 466 battalions.

Cavalry.—18 brigades, 42 regiments, 252 squadrons.

Field Artillery.—14 brigades, 56 regiments, 16 horse artillery batteries, 224 field batteries, 14 mountain batteries, 6 regiments, 18 battalions, 72 companies siege artillery.

Engineers.—15 battalions, 75 companies.

Train.—3 regiments, 15 divisions, and 95 squadrons of train troops.

There are 9 Territorial Austrian Landwehr districts, containing 11 infantry brigades, 31 regiments, 102 battalions, 6 cavalry regiments, 39 squadrons.

There are 7 districts of Hungarian Landwehr, comprising 14 infantry brigades, 28 regiments, 94 battalions, 4 cavalry brigades, 10 regiments, 60 squadrons.

The total peace strength is :—

Regular Army, about 285,000, with 1,048 guns.

Imperial Austrian Landwehr, about 25,000.

Hungarian Landwehr, about 25,000.

The following is the approximate peace strength of the chief units :—

Service.	Infantry Battalion.		Cavalry Squadron.		Horse Art. Battery.			Field Art. Battery.		
	Offrs.	Men.	Offrs.	Men.	Offrs.	Men.	Guns.	Offrs.	Men.	Guns.
Regular Army (Higher Establishment)	18	520	5	166	5	122	6	4	101	4
Austrian Imperial Landwehr	14	219	—	—	—	—	—	—	—	—
Royal Hungarian „	28	208	—	—	—	—	—	—	—	—

Surgeons, Paymasters, and their servants not included.

The war establishments of units are not published.

One mounted commanding officer's bugler per battalion has taken the place of the ordinary foot bugler in all battalions of Regulars and of the Austrian and Hungarian Landwehr.

Engineers.—Great attention has been paid to the organisation of the Engineers.

The 15 independent battalions consist of 5 field companies, an implements reserve, and a company cadre-reserve. On mobilisation, out of the 5th Company the 5th, 6th, and 7th Companies are formed, and from the implements reserve an entrenching-tool column is formed.

Each field company in peace consists of 5 officers, 107 men, of which number 99 are armed with the repeater rifle.

The implements reserve has only a peace strength of 1 officer and 9 men.

Each company cadre-reserve has 2 officers and 7 men.

In each battalion a captain is included as officer-instructor, etc.

The field equipment of each company consists of section equipment and company equipment. The first is divided into portable and wagon

equipment. Nearly the whole section carries entrenching and half carries cutting tools. To compensate the men for carrying the tools, their valises are carried for them in the section wagons. The wagon equipment consists of other tools and of explosive material, which are carried in one wagon. The company equipment merely comprises reserves of section equipment.

In peace the implements reserve supplies other articles besides digging or cutting tools, such as bridging equipage. In war it carries bridging repair material for hasty and for semi-permanent bridges, and is attached to the ordinary bridging train of the corps.

The bridging train is horsed by the corps train horses. Each section carries material for a bridge 53 metres long, and both trestles and floating supports. This is either light or ordinary bridging. The former is part of the normal equipage of each corps. The latter is issued when specially required.

The entrenching tool column, formed from its reserve, carries material to replace that used up by the troops, also 1,150 heavy entrenching and 170 cutting tools and explosives. It is attached to the field park of the train of one of the army corps.

The engineers also form special sections for the following work :—

- a. 4 Eiffel bridging detachments for the repair and restoration of permanent bridges. It carries material enough for 120 metres length of bridge.
- b. 3 river-mine detachments for the destruction of bridges and obstruction of streams.
- c. 2 mining detachments.
- d. 1 river navigation detachment.
- e. Detachments for engineer commands.
- f. A siege detachment for the mobile engineer siege park.

The engineer implement dépôt in Klosterneuburg, as headquarters, has a branch in Wöllersdorf for the manufacture and supply of explosives, igniting, and lighting material. On mobilisation it furnishes the following :—

- a. 3 mobile implement dépôts of material for the construction of the larger bridges and for water transport generally.
- b. 3 mobile entrenching tool dépôts for heavy siege work and replenishment of the entrenching columns.
- c. 2 engineer siege parks with everything necessary for the attack on an entrenched camp.

A regular siege park is formed in addition when specially required.

A new Cavalry Drill has been issued.

A provisional Artillery Drill, Part I., and Field Artillery Drill, Part III., was issued.

Attempts have been made to evade the universal military language (German). These have been suppressed.

Manœuvres.—Four Army Corps were mobilised for manœuvres before the Emperor in 1899. The Landwehr Divisions from Prag, Josephstadt, Gratz, and Innsbrück took part in these.

BULGARIA AND ROUMANIA.

In view of the complications that have arisen between Roumania and Bulgaria, it is as well to take a cursory glance at the strength and organisation of the Armies of these States in 1899, though our space does not admit of going into much detail. (*For Roumania see further on under R.*)

BULGARIA.

The Bulgarian Army remains practically on the same footing as in 1898, of which a short *résumé* was given on p. 1091 of the JOURNAL for October, 1899.

Infantry.—The re-organisation of the infantry reserve regiments, which was to have been completed by the end of 1899, was postponed till the spring of 1900. According to the Ukase of the 13th January, 1899, it was decreed that the cadres of the Reserve regiments were to be detached from their territorial Line regiments and formed into 12 independent Reserve regiments, of which 2 were to form part of each Division. Each regiment was to consist of 5 companies, and be brought up to a strength of 600 officers and men. The 6 half-companies of mounted infantry, each 45 strong, were to be distributed among the 6 Divisions. The 5th Border Companies in each regiment were to be formed into a frontier defence regiment. The Government has now about 165 magazine rifles or carbines of the Mannlicher 1895 pattern (315-inch).

Cavalry.—The following change in the cavalry organisation will probably be carried out in 1900 :—The formation of a Cavalry Division is contemplated, and besides this it is intended to have 2 Cavalry Brigades. Further, out of the 5th Squadrons of the Cavalry attached to the 1st and 2nd Infantry Divisions and from the 5th Regiment Cavalry, it is proposed to form divisional cavalry regiments for each of the 6 Infantry Divisions, each regiment to consist at present of 2 squadrons of 150 men to begin with, but to be increased to full strength later. Then the whole strength of cavalry of the Line will be :—

	Squadrons.
1 Cavalry Division = 2 Brigades of 2 regiments	
(4 squadrons) - - - - -	16
12 squadrons of divisional Cavalry - - - - -	12
1 squadron of the body guard - - - - -	1
Total - - - - -	29

The Bulgarians are not born cavalry soldiers, and the vacillating nature of the re-organisation projects, as regards the cavalry, shows that their authorities have no clear ideas of the employment of cavalry.

Artillery.—The formation of a mountain artillery regiment from the 3 mountain detachments hitherto forming part of the 2nd, 3rd, and 4th Artillery Regiments, which was indicated in the Report of 1898, has been

carried out. 18 Creusot-Canet 7·5 centimetres (2·95 inches) of the Krupp pattern, and 24 Canet Q.F. guns, 12 centimetres (4·7 inches), and 24 Canet field mortars of 15 centimetres (5·9 inches) have been ordered, but have not yet been delivered, probably because their workshops are not yet in a sufficiently advanced state to carry out the orders, and partly because the imitation of Krupp is not quite a success.

The war strength of the different units is as under:—

—	Officers.	Men.	Guns and Ammunition Wagons.
The Field Battalion, about	14	1,000	—
The Reserve Battalion, about	10	820	—
A Company of 1st Class Reserve	—	160 to 250	—
A Company of 2nd Class Reserve	6	100 to 160	—
A Squadron of Cavalry	6	230	—
A Battery of Field Artillery... ..	5	170	6—8
A Battery of Mountain Artillery	4	185	6

The contingent of recruits for 1899 amounted to 19,000 men.

FRANCE, 1899.

Many changes have been made, but none of great importance.

A 21st Army Corps is to be formed on the eastern frontier. The Zouave and Algerian Tirailleur Regiments have been increased by twelve battalions. The artillery has been increased by a number of regiments and batteries, which even in peace-time are now attached to Infantry Divisions.

New issues of Cavalry Drill and Field Artillery Drill were made in 1899.

A brief *résumé* of the organisation of the French Army, showing the strengths, is given:—

Army Corps.	Region Hd.-Qrs.	No. of Divn.	Infantry.				Cavalry.			Field Artillery.				Garr. Art.		Engineers.			Train.		Remarks.	
			Brig.	Regts.	Battns.	Cos.	Brig.	Regts.	Sqdns.	H.A.B.	F.A.B.	M.B.	Regts.	Battns.	Regts.	Battns.	Cos.	Sqdns.	Cos.			
I.	Lille ...	{ †	4	9	37	150	1 ^a	2	10	1	2	2	21	—	1	6	1	3	13	1	3	{ † The Divisions are numbered successively throughout the Army. { ¹ Exclusive of 4th Cuirass. Regt. of 5 Cav. Divns. in the Region. { ² Exc. of 9th Cuirass. Regt. and 2nd Hussar. Regt. of 55th Cav. Divn.
II.	Amiens ...	{ 4	4	8	33	132	1 ^a	2	10	1	2	2	21	—	—	—	—	—	—	1	3	{ ‡ Exc. of 4th Cuirass. Regt. of 3rd Cav. Div. 7th " " " " 2 H.A. Battns. " " " " 4th Huss. Regt. 5th "
III.	Rouen ...	{ 6	4	8	32	138	1	2	10	1	2	2	21	—	1	2	—	—	—	1	3	{ ‡ Exc. of 13th Cuirass. Regt. of 7th Cav. Divn. { ⁴ Exc. of 29th Drag. Regt. of 3rd Cav. Div. " " 7th " Battns. " " " " 4th Huss. Regt. 5th "
IV.	Le Mans ...	{ 8	4	8	32	128	1 ^a	2	10	1	2	4	21	—	—	—	—	—	—	1	3	{ ‡ Exc. of 16th Drag. Regt. of 8th Cav. Div. " " 22nd "
V.	Orleans ...	{ 10	4	8	32	128	1 ^a	2	10	1	2	4	23	—	—	—	—	—	—	1	3	{ ‡ Exc. of 4th Rifle Regt. (2nd Cav. Div.) 14th " " (7th " " 7 Exc. of 11 Huss. Regt. (6th " " 12 "
VI.	Châlons-s.-M. ...	{ 42	6	12	53	242	1 ^a	2	10	1	2	7	24	—	2	13	—	—	—	1	3	{ Exc. of 8th Rifle Regt. (7th Cav. Div.) " " 8th " " (" " "
VII.	Besançon ...	{ 41	6	10 ⁶	45	190	1 ^a	2	10	1	2	2	23	—	3	16	—	—	—	1	3	{ Exc. of 5th Cuirass. Regt. (3rd Cav. Div.) " " 8th " " (" " "
VIII.	Bourges ...	{ 16	4	8 ⁸	32	128	1	2	10	1	2	2	21	—	—	—	—	—	—	1	3	{ Exc. of 5th Cuirass. Regt. (3rd Cav. Div.) " " 8th " " (" " "
IX.	Tours ...	{ 18	4	8	32	128	1 ^a	2	10	1	2	2	24	—	—	—	1	3	12	1	3	{ Exc. of 5th Cuirass. Regt. (3rd Cav. Div.) " " 8th " " (" " "
X.	Rennes ...	{ 20	4	8	32	128	1	2	10	1	2	2	21	—	1	5	—	—	—	1	3	{ Exc. of 5th Cuirass. Regt. (3rd Cav. Div.) " " 8th " " (" " "
XI.	Nantes ..	{ 22	4	8	32	128	1	2	10	1	2	2	21	—	1	7	—	—	—	1	3	{ Exc. of 5th Cuirass. Regt. (3rd Cav. Div.) " " 8th " " (" " "
XII.	Limoges ...	{ 23	4	8	32	128	1	2	10	1	2	2	21	—	—	—	—	—	—	1	3	{ Exc. of 5th Cuirass. Regt. (3rd Cav. Div.) " " 8th " " (" " "
XIII.	Clermont- Ferand	{ 25	4	8	32	128	1	2	10	1	2	2	21	—	—	—	—	—	—	1	3	{ Exc. of 5th Cuirass. Regt. (3rd Cav. Div.) " " 8th " " (" " "

Army Corps.	Region Hd.-Qrs.	No. of Divn.	Infantry.				Cavalry.			Field Artillery.				Garr. Art.		Engineers.			Train.		Remarks.	
			Brig.	Regts.	Battns.	Cos.	Brig.	Regts.	Sqdns.	Brig.	Regts.	H.A.B.	F.A.B.	M.B.	Regts.	Battns.	Cos.	Sqdns.	Cos.			
XIV.	Lyons ...	{ 27 28	5	11	51	205	1 st	2	10	1	2	2	24	8	1	12	1	2	9	1	3	{ 10 Exc. of 7th and 10th Cuirass. Regts. Exc. of 2nd and 10th Drng. Regts. 6th Cav. Div.
XV.	Marseilles ...	{ 29 30	4	9 ¹¹	41	174	1	2	10	1	2 nd	2	20 ¹¹	6 ¹¹	3	14	1	7	17	1	3	{ 11 Including 1 Inf. Regt. in Corsica. " 1 Batt. H.A. " " 1 " F.A. " " 1 " G.A. "
XVI.	Montpellier ...	{ 31 32	4	8	32	123	1	2	10	1	2	2	21	—	—	—	1	3	13	1	3	
XVII.	Toulouse ...	{ 33 34	4	8	32	123	1	2	10	1	2	2	21	—	—	—	—	—	—	1	3	
XVIII.	Bordeaux ...	{ 35 36	4	8	32	123	1	2	10	1	2	2	21	—	1	7	—	—	—	1	3	
XIX.	Algeria ..	{ 3 Terr	4	8	43	186	3	8	41	—	—	—	9	—	1	3	—	—	3	*	9	{ * 3 Troops each from the 5th, 17th, and 18th Train-Squadrons are attached.
XX.	Nancy ...	{ 11 39	4	8	37	138	1 st	2	10	1	2	2	21	—	1	8	—	1	4	1	3	{ 5th Md. Rifles Exc. of 11 12 13 Cuirass. Regt. 8 9 Drng. Regt. 2nd Div.
	Tunis ...	1	2	2	16	70	1	2	10	—	—	—	3	—	1	3	—	1	—	—	3	{ 12 These belong to the 6th Cav. Div.
	Military Govt., Paris ...	—	—	—	1	6*	3 rd	6	30	1	2	5	19	—	1	6	2	5	22	1	3	{ * Besides these Troops there are the 5th, 8th, and 10th Divns., the 6th Inf. Brig., the 3rd Art. Brig. within the Paris district.
	Approx. Total.	43	91	173	741	—	26	54	448	20	40	52	442	14	18	102	7	27	—	20	72	{ 7 Cav. Divns. of 3 Brigs. (6 Regts.) each are in addition.

The above *résumé* is given to show approximately the organisation and strength of the Regular French Army,
as British Officers often underestimate this.—TRANSLATOR.

It will be shown below how this vast force can be rapidly increased. It is probable that 5 armies, each of 4 or 5 Army Corps, could be mobilised rapidly for war.

The peace and war establishments of the units of the French Army differ somewhat from those of 1896 (given in the JOURNAL for November, 1897). As regards the Infantry, 4 companies, as a rule, form a battalion, 4 battalions a regiment, 2 regiments a Brigade, 2 Brigades a Division, and 2 Divisions an Army Corps.

6 regiments of 5 squadrons usually form a Cavalry Division. The strength of units is approximately as under :—

	Battalions		Squadrons		Batteries						Companies		Remarks.
	Infantry.		Cavalry.		H.A.		F.A.		G.A.		Engineers.		
	Peace.	War.	Peace.	War.	Peace.	War.	Peace.	War.	Peace.	War.	Peace.	War.	
Officers ..	14 ¹	18	5	5	4	4	4	4	4	4	4	4	¹ Rifle Battalions have 22 officers and 796 men, and the 12 Alpine Rifle Bns. are stronger by 5 officers and 116 men each than the other R.B.
N.C.O. & Men	506	1050	140	155	105	188	103	180	129	...	190	...	
Horses ...	6	31	139	160	87	217	61	163	...	...	...	...
Guns ..	...	...	...	...	4	6	4	6	...	...	...	...
Am. Wagons...	...	...	...	...	2	9	2	9	...	...	...	...
Other Wagons	...	7	...	1	

On mobilisation, every company is at once increased by 1 officer, 13 non-commissioned officers.

In like manner every squadron by 1 officer, 6 non-commissioned officers.

The 2nd captains of batteries of artillery in peace quit them on mobilisation, and take command of ammunition columns.

It is said to be the intention to re-form all the field batteries into 4 gun batteries, with 12 ammunition wagons, as soon as all are armed with the new field gun.

A number of artillery regiments and batteries have been added, and these are now attached, even in peace-time, to Infantry Divisions.

The Artillery has been partly re-armed with the 7.5-centimetre (2.95-inch) gun of 1897, and partly with the 12-centimetre (4.72-inch) field howitzer. (See under Artillery Material, p. 1321.)

Infantry Additions.—In accordance with the law of February, 1899, a fifth battalion is to be raised for each of the 4 Zouave regiments, having its headquarters at home, its establishment being 14 officers and 540 men, and the War Minister was empowered to fix by his decree the number of battalions of the Algerian Tirailleur regiments. In February and July each of these regiments was accordingly increased to 6 battalions and a dépôt company.

The staff of each regiment consists of 20 officers, 3 surgeons, 85 non-commissioned officers and men. Each company of 1 captain, 4 subalterns, 21 non-commissioned officers and musicians, 140 privates, "Dépôt," 5 officers, 44 non-commissioned officers and men.

The whole strength of a regiment is 75 officers, 3,910 non-commissioned officers and men. In the Budget Estimates all 163 regiments were shown with 4 battalions, but at present all regiments have not got their fourth battalion. It is probable, however, that these will be at once raised. It is said to be the intention of the authorities to form these fourth battalions into 19 new Brigades, of which one is to be apportioned to each of the 19 Army Corps in the interior of France. In this provisional manner, 12 of the newly-raised fourth battalions were formed into 6 "*Régiments de marche*" of 2 battalions each, and apportioned as follows to strengthen the garrisons of the Algerian Maritime Districts:—2 each to Oran and Tunis, 1 each to Algiers and Constantin.

Artillery.—In a decree of February the formation of the staff of the 18th Battalion of Garrison Artillery (Brest) and the raising of two new batteries were ordered. The 2nd, 3rd, 4th, and 7th Batteries of the 15th Battalion were taken for the former. Of the two latter, one was apportioned to the 14th Battalion; the others to the 13th Artillery Regiment in Africa.

The 40 regiments of Field Artillery in the interior of France comprise 52 batteries horse artillery, 430 batteries of field artillery, and 14 mountain batteries.

In Algeria and Tunis are 12 batteries Field Artillery (8 having been converted from mountain batteries).

The above 40 regiments are formed into 20 Artillery Brigades of 2 regiments each. The regiments generally have 1 Horse Artillery battery and 10 Field Batteries, and some have Mountain Batteries. But they all vary.

THE GERMAN EMPIRE.

It is impossible to do more here than note with reference to the table which follows that two new Army Corps are being formed, and that by the end of the financial year 1902 the peace establishment will be increased to 625 battalions, 482 squadrons (inclusive of mounted rifles), 574 batteries, 26 battalions of engineers, and 23 battalions of the train (A.S.C.).

The Report enters into the details of the various changes in the several Army Corps in 1899, which our space does not admit of going into.

Military Education.—The ensigns' (Fähnrichs') examinations having shown that the general education of candidates had of late been very superficial, orders have been given to revert and strictly adhere to the standards required in 1880, which had of late been relaxed, owing to the demand for officers. This will have a good effect on the further professional education of officers.* A new "Musketry Instruction," embodying recent experience, was issued in 1899.

Discipline.—Punishment returns prove the increase of the rough and rowdy element in the youth of the Empire.

The new Military Punishments Act has been in operation since December, 1898.

* This should be noted by those who are clamouring for the further reduction of the rules for the entrance examinations of British officers, which has been permitted this year on emergency.—TRANSLATOR.

The peace strength of the German Army was as under on the 1st October, 1899:—

Army Corps.	Station.	No. of Divisions.	Infantry. ¹				Cavalry. ²				Field Artillery. ³				Garrison Artillery. ⁴				Engineers.		Train.		Line of Communication. ⁵						Remarks.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
			Brigades.		Regiments.		Battalions.		Brigades.	Regiments.	Squadrons.	Brigades.	Regiments.	Divisions.	H. A. Batts.	F. A. Batts.	Regiments.	Battalions.	Companies.	Battalions.	Companies.	Battalions.	Companies.	Railway Troops.		Telegraph.	Cos.	Battns.		Cos.	Battns.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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Guard	Berlin ...	{ 2 Inf. 1 Cav.	5	11	33	4	8	41	2	4	9	5	20	1	2	8	1	4	1	3	1	3	6	24	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1</

No details are allowed to be published regarding the War Establishments or Mobilisation.
The above is given as showing in concise form the organisation and strength of the German Army.

Food.—The experiments with sugar and Tropon have been continued. If the latter prove successful, each soldier's 3 days "iron ration" will be reduced in weight from 4·3 lbs. to 2·6 lbs.

Experiments have shown that the Pumpnickel (rye) bread is deficient in nourishment.

The establishment of convalescent homes for invalid soldiers was sanctioned in March, 1899, as the experiments made had proved successful.

Motor Cars.—Experiments with light motor cars are being continued. At the 1899 manœuvres an average of 15 miles an hour was got out of these cars on good roads for 3 days in succession.

Machine Guns.—Experiments have been made with these.

Cyclists.—The use of cycles for military purposes is on the increase. In manœuvres, however, only those included in the Establishments are allowed to be used.

The Pigeon Post.—Several experiments with homing pigeons were made, especially for communication from ship to shore. From Hamburg many pigeons were taken to sea in July. The first pigeon that arrived did the distance at the rate of 31 miles an hour.

A new pigeon training depôt has been established in Spandau. Messenger pigeons were also used by the Cavalry Divisions at the manœuvres.

War Dogs.—Much progress has been made with war dogs. A cross between the collie and an English sheep dog proved very tractable, but a variety of the poodle breed gave the best results. The messenger dogs used at the manœuvres were most useful.

Signalling.—Extensive experiments made with war balloons, wireless telegraphy (Funkentelegraphie), and optical signalling proved successful. The heliograph and limelight by night were much used and found indispensable. A Cabinet Order of the Emperor's, dated 1st January, 1899, orders the suppression of all foreign nomenclature in German official works, reports, etc.

GREAT BRITAIN, 1899.

More space than usual is given in the Report to the military forces of the British Empire. The peace and war establishments and the total strength of Regular troops, Militia and Volunteers available in 1899 are given, the additions to the Army are noted, and the various changes chronicled. The formation of the Army Corps for service in South Africa, the raising of the Imperial Yeomanry, and the attaching of Volunteer companies to their affiliated battalions are described in detail. The dates of the mobilisation of the 5th, 6th, and 7th Divisions and the formation of Colonial contingents, etc., and the other measures taken to increase the fighting strength of the British Empire, are given. These are, however, well known to our readers, so are not reproduced here.

ITALY.

The organisation of the Italian Army remains as it was. There are 12 Army Corps, each constituted as follows:—

Divisions.	Infantry.				Cavalry.		Field Artillery.			Engineers.	Bearer Companies.	Supply Companies.	Remarks.
	Brigades.	Regiments.	Battalions.	Companies.	Regiments.	Squadrons.	Regiments.	Brigade Divisions.	Battalions.				
2	4	9 ¹	27	108	1	6	2	4	16 ²	2	1	1	¹ Including 1 Bersaglieri Regt. ² Each of 6 guns in war.

The 9th Army Corps at Rome has 3 Divisions, as it includes the Sardinian Division (a Militia Division of all arms with transport, about 11,600 strong). The 3rd Corps at Milan has 2 Bersaglieri regiments, and the 5th, at Verona, 3.

There are 14 Bersaglieri regiments altogether, each of 3 battalions. Each battalion about 1,000 rifles at war strength.

Last year the Standing Army was increased by 10,000 men. The Mobile Militia was decreased by 2,400 and the Territorial Militia by 91,250. About one-third of the whole (chiefly of the latter) was untrained.*

The headquarters of the 4th Corps and of the artillery district was moved from Piacenza to Genoa for defensive purposes.

The average strength estimated for in 1899-1900 was 13,527 officers, 212,200 N.C.O.'s and men, 46,162 horses.

The great tunnel through the Col di Tenda is practically finished, and in future an infantry or Bersaglieri battalion will permanently be stationed in the neighbourhood instead of only for certain months in the year.

Italy has not yet decided on a Q.F. field gun.

A Defence Committee now sits regularly to decide on important military measures.**

Exercises.—Great autumn manœuvres were held south of Turin between the 1st and 2nd Army Corps.***

In addition to the practice afforded at the Royal manœuvres, special Cavalry manœuvres were also held. In Piedmont a Cavalry Division of 4 regiments was formed. Cavalry Brigade manœuvres were carried out

* There is a Colonial Force in Erythrea of 239 officers and 6,500 men. Details of this were given in No. 266 of the JOURNAL (April, 1900), p. 468.—TRANSLATOR.

** The present King is the President of the Defence Committee, which is a guarantee, as the Report says, of its efficiency.—TRANSLATOR.

*** These were fully reported on in No. 266 of the JOURNAL for April, 1900, p. 425, and are of especial interest, as manœuvres in 1898, 1896, and in several previous years, for financial or political reasons were not held.—TRANSLATOR.

near Gallarate from the 16th to the 23rd August, opportunity being taken of the change of quarters of the régiments to hold these.

From the 1st to the 13th strategical reconnaissances were practised. From the 19th to the 23rd Cavalry fights for the line of the Ticino took place. Inefficient reconnaissance on the one side led to surprise by the other, and the attacks were weakened by too much splitting-up of the forces.

A cyclist company was attached to the Cavalry for these manoeuvres and did good service. The folding cycle proved superior to the rigid cycle.

An Army Order of February, 1899, prescribed for all officers of Cavalry régiments, except the commanding officer, a cross-country ride of at least 5 miles in length, to be executed at full gallop once a year before the annual manoeuvres, or during them, should the country in the neighbourhood of the regimental headquarters be absolutely unsuited to the purpose. The commanding officer is to select the actual ground and to keep it a rigid secret till the day of trial.

Reconnaissance rides of 50 to 125 miles are also to be carried out by all subaltern officers once in two years, and by captains and majors before promotion. The rate is not to exceed about 3 miles an hour, and the distance ridden is never to exceed 56 miles in one day. Troop horses or officers' chargers may be used, but they are not to have any special previous preparation for this exercise. The condition of the horse on the completion of the work is to be taken into consideration in criticising the performance. Long-distance rides are also practised.

ROUMANIA, 1899.

In the King's speech, at the opening of the Roumanian Parliament, in November, 1899, he announced that the organisation of the whole defensive force of the kingdom was on the point of completion, and that the Budget would be burdened with no extraordinary charges for this, unless the progress of technical material necessitated important changes.

The war rationed strength is still reckoned, as in 1898, at 3,948 officers and 16,316 men, and the combatant strength as 140,352 men, with 384 guns; but the Report states that, according to Roumanian reckoning, a maximum strength of 280,000 men (*i.e.*, about $4\frac{1}{2}$ per cent. of the population) could be attained.

The 4 Army Corps have an average strength of 2 Divisions, 4 Brigades, 25 battalions, 13 cavalry régiments (12 squadrons), 1 horse artillery battery, 15 field batteries, 1 regiment corps artillery, 1 company sappers, 4 technical companies and 1 squadron for the train, 1 corps ambulance and sanitary company, ammunition columns, etc., or about 35,000 fighting men.

The Cavalry Divisions have 2 Brigades each of 3 régiments, 2 Horse Artillery batteries, 1 ammunition column, 2 supply sections, 2 ambulance sections. Each Cavalry Brigade counts about 2,080 fighting men.

The Infantry and Rifle Battalions have a war strength of about 1,000 rifles, the Cavalry squadrons about 175 sabres, the Horse Artillery batteries about 180 men, the light artillery battalion about 150, the heavy battalion about 180. All batteries have 6 guns and 8 ammunition wagons.

Only one of the 3 regiments authorised to be raised in the spring of 1898 has yet been embodied in the Army.

The Roumanian infantry is chiefly armed with the Austrian Mannlicher magazine rifle, M/93, calibre 6.5 millimetres (.256 inch), but only 155,000 of these rifles and 14,000 carbines of this pattern are actually in store. Owing, it is presumed, to money difficulties, the intention to increase this number until arms for the maximum attainable strength could be provided has not been proceeded with, but 100,000 of the old Martini rifles in hand are to be converted to the above-mentioned calibre.

The financial condition of Roumania is not favourable, and will much hamper the military development of the kingdom.

RUSSIA, 1899.

No important changes are recorded in the Russian Army in 1899. Financial reasons probably limit these.

The Report gives a tabular statement of the military districts and the 23 Army Corps, Divisions, etc. The field armies of Russia at war strength amount to $1\frac{1}{2}$ millions of men, with 800,000 in reserve, their total strength, including non-combatants, being about 4 millions, all of which may be considered available. Of these only 5 infantry brigades (40 battalions), 1 Cossack brigade (6 regiments, each 6 squadrons), 17 batteries of artillery, 11 companies field engineers, besides garrison infantry, artillery, and engineers, were in the Amur district on the 1st May, 1899.

As a rule, 4 companies form a battalion, 4 battalions a regiment, 4 regiments a Brigade, 2 Brigades a Division, 2 Divisions a Corps, but in many cases they vary.*

The smaller units vary in strength:—

	Officers.	Men.	
The battalions of Field Army from	17	500	in peace.
	to 18	960	in war.
Squadrons of Regular Cavalry from	5	150	in peace.
	to 6	150	in war.
Heavy field batteries from	-	6	208 in peace (4 guns).
	to 6	260	in war (8 guns).
Light " " "	-	6	180 in peace (4 guns).
	to 6	288	in war (8 guns).
Horse Artillery from	-	5	186 in peace (6 guns).
	to 5	209	in war (6 guns).

*A complete list of the military districts was given in the JOURNAL for March, 1898. This gave the names of the commanders.—TRANSLATOR.

The commander of the 2nd Army Corps is the commander-in-chief in Turkestan.

The Siberian Corps.—The Siberian troops and those in the Amur Districts are being re-organised; the former in 2 Army Corps.*

The military districts Omsk and Irkutsk are now included in the Siberian Military District.

The 7th Reserve Cadre Battalion of the Siberian District is already forming cadres of 7 officers and 40 men as the *nuclei* of other Reserve battalions.

The 2 Reserve battalions, Tschita and Strätensk (Amur District), are to form, in war, a regiment of 4 battalions and a Reserve battalion. A second garrison artillery regiment of 3 battalions is being formed at Vladivostok.

The 5 battalions of the 2nd East Siberian Line Brigade are to be formed into 5 regiments of 2 battalions each. A Siberian Reserve Brigade Division is being formed. This will, in war, make 4 Brigade Divisions of 2 batteries each. A company of engineers is being added to the garrison of Kwantung Peninsula.

The question of remounts is again cropping up. The Government price is so low that as many horses as possible are sold out of the country. Prices have, therefore, been raised, and now £20 are given for the remounts in the Siberian and Amur Districts. This includes all expenses in supplying the horses.

Manœuvres on a large scale were held in all military districts in 1899. The Emperor only attended those of Krassnoe Selo. Cavalry Corps manœuvres were also held at Wilna, Warsaw, and Kiev. Great Cavalry manœuvres were held at Oran. These proved most useful, as well as the other cavalry manœuvres now regularly held, and those of cavalry in combination with the other arms, especially those at Warsaw.

Partial mobilisation of several Reserves took place under the immediate direction of General Dragomiroff, and was successfully accomplished.

TURKEY.

The Report speaks very favourably of the progress made by Turkey in military matters since the Græco-Turkish War in 1897, to which the work of von der Goltz Pasha and the visit of the Emperor William in 1899 gave fresh impulse.

The Turkish Army consists of 7 Corps and 2 independent Divisions, 19 Divisions in all; 314 battalions, 6 Cavalry Divisions of 3 Brigades each (199 squadrons), 258 field, mountain, and howitzer batteries, 4 battalions of engineers, 121 companies of garrison artillery, and 2 battalions and 15 squadrons of "Train" troops. Altogether about 200,000 Regulars (Nizam).

* This year Lieut.-General Linevitch, formerly commanding the Siberian Corps, has been appointed commander of the 1st Siberian Army Corps, and Lieut.-General Baron Kaulbars commander of the 2nd Siberian Army Corps.—
TRANSLATOR.

There are 22 Divisions (364 battalions) of Redifs (Reserves), and 170 battalions of Ilawe (second-class Reserve), besides local Militia.

All told, Turkey could put 1,456,000 men in the field, including Garrison Artillery, non-combatants, etc., but exclusive of Volunteers.

The war strength of the units is as follows :—

—	Officers.	Men.	Horses or Mules.	Guns.	Ammuni- tion.
Infantry Battalions	24	898	51	—	—
Squadrons	6	134	144	—	—
Horse Artillery Batteries ...	4	156	167	6	6
Field Artillery Batteries ...	4	133	100	6	6
Howitzer Batteries	4	140	88	6	3
Mountain Batteries	3	111	79	6	—

The Army has been re-organised by German officers, and at the end of 1899 the following officers were attached to the German Army for instruction :—General staff 4, infantry 14, cavalry 8, field artillery 3, garrison artillery 2, engineers 2.

Arms.—The first 4 Army Corps are armed with Mauser magazine rifles, some the large .374-inch, and the others .276-inch.

Ammunition factories have been built, but for some years to come Turkey will have to buy her cartridges abroad.

Ninety-six Q.F. field guns are being contracted for with Krupp. They will be 7·5-centimetre (2·95-inch), with “separated” ammunition.

The whole of Turkey in Europe was mapped in 1892 (by the Russians) on a scale of $\frac{1}{2,100,000}$, and this has been corrected and lithographed.

UNITED STATES, 1899.

The United States Army is still in a “provisional” state.

The Regular Infantry is formed in regiments of 3 battalions of 4 companies each; the Cavalry in regiments of 3 squadrons of 4 troops each; the Regular Artillery in regiments of 2 field and 2 garrison batteries each; the Regular Engineers in regiments of 1 battalion of 5 companies each; signallers and balloon detachments are attached. The total strength is about :—

34,500 Infantry.
12,300 Cavalry.
11,970 Artillery.
750 Engineers.

There are 24 regiments of Volunteers of 3 battalions of 4 companies each, and 1 regiment of Cavalry of 3 squadrons of 4 troops each. Altogether, these number about 33,500 Infantry and 1,200 Cavalry.

	Officers.	Men.	Guns.
The battalion, as a rule, musters	14	450	0
Troop Cavalry	3	100	0
Batteries Artillery	4	160	6

Brigades are formed in the Philippines, etc., as required. These are disposed as follows:—

—	United States.	Philippines.	Cuba.	Porto Rico
Infantry Battalions ...	11	49	12	3
Cavalry Regiments ...	3	2	4	1
Artillery Batteries ...	{ F.A. = 7 G.A. = 58	{ F.A. = 5 G.A. = 14	{ F.A.=5 G.A.=8	G.A.=2

The Army Bill of 2nd March, 1900, fixed the strength of the Regular Army at:—

25 Infantry Regiments.

10 Cavalry „

7 Artillery „

Until the 1st July, 1901, the President is empowered to raise the forces to the strength of 65,000 men, and to call out 35,000 Volunteers.

This power was exercised by President M'Kinley, who, in March, 1899, raised the Regular Army to the strength given above. In July and August he called out 24 Infantry and 1 Cavalry regiments for service abroad.

The Infantry in the various States was approximated as follows:—

Infantry	-	-	-	-	89,500
Cavalry	-	-	-	-	4,000
Artillery	-	-	-	-	4,360
Engineers	-	-	-	-	300

But these are only paper strengths.

The United States Army is clothed in khaki.

PART II.

Reports on the Different Branches of the Service.

(1) INFANTRY AND COMBINED TACTICS.

The new Russian "Regulations for Field Service" appeared in 1899. These are entirely founded on those of other nations. Their style shows how little Russian officers are educated to think for themselves. Not only are the simplest matters minutely described, but a number of examples of orders are given, as in our little "Lehnert's" Handbook. This was done by special request of the commanders of troops. Besides this, "Schemes" for outposts are given, and we may be sure that Russian outposts will always be drawn up according to these schemes.

The Instructions for Marches are similar to the French, and minute directions are giving regarding matters of course.

The Drill-books of all nations are based on target practice results. The experiences of the Boer War will not be available for some time. As yet the accounts are unreliable. Especially wanting are details of the Infantry fighting, without which it is impossible to follow the battle, map

in hand, and trace its varying phases, which alone enables useful tactical deductions to be drawn.*

One point, however, is clear. We must habituate ourselves to a much earlier deployment of our infantry than is customary at our exercises and manœuvres. The English were repulsed more than once by an unseen foe. We will avoid joining in the chorus of disapprobation which ascribes all failure to English generalship. How capable or incapable these may have been cannot be determined until full official accounts of the campaign lie before us. For us, it is sufficient here to examine the question whether the peace training of the troops stood the test of war, and if *our* (German) fighting methods would have done so better. In the daily Press many fantastic views have been expressed. The South African events have been reported home without criticism, and thereon the most venturesome proposals for changes in the whole method of infantry tactics have been put forward. It is inferred from the Boer successes that all close formations on the battle-field are not only harmful, but superfluous, and that thousands of men can simply be moved and fight in extended order.

This view overlooks the fact that in no European Army is such material to be found as in the South African Republics. Modern civilised States do not produce men born, as it were, on horseback, and bred to the use of the rifle; and this people, which embodies in a nation the very ideal of the independent intelligent individual combatant, is opposed to an Army which, it is true, is very brave, but which commits so many serious blunders that one may venture to say it does not stand on a par with the Armies of the European Great Powers. The English, however, were almost always surprised at short range, and the decision was brought about without their seeing their opponents.**

It behoves us to consider whether we should not commence our deployments far sooner. The fault lies partly in our cramped drill grounds, which only admit of an advance in one direction for about 600 metres. But this is not all. Our Drill-book orders the advanced troops to approach as near as the nature of the ground permits to the position before opening fire. This is, in its application, often overdone. The addition of the words "atmospheric conditions," and, above all, "the fire of the enemy," should be inserted. The rule is a common-sense one. No one would dream of stopping a forward movement until circumstances compel it, as every step in the advance won without fighting is so much gained. The real difficulty is, however, to settle *how* near one can approach. In peace, the determining factor of the enemy's fire is absent. The fact is, this distance is indeterminable. It is, therefore, false teaching to say that fire shall be opened at such and such a distance, or to say the

* In regard to this, it is to be hoped that, as these detailed reports will reach us before the Germans, we may not have to await *their* action in the matter.—TRANSLATOR.

** The author here generalises from the actions in the earlier period of the Boer War, and is apparently not very well informed in regard to those.—TRANSLATOR.

"decisive fire position" (to use this unfortunate expression) is to be found at so many metres from the enemy. For even in open country, and on the same ground, this will be one day here and another there, and different in the morning and in the evening, according to the atmospheric changes.

Fire must be opened when advance is no longer possible without firing. The last position before the assault is wherever it is possible from thence so to overwhelm the defender with fire, that, his nerves being shattered, he will give way on the attackers rushing with loud hurrahs to the assault.

Though under certain circumstances—under morning haze, fog, etc.—it may be necessary for the attacker to approach even to within 200 metres to obtain the required preponderance of fire, under ordinary circumstances this distance may be about 600 metres. But with favourable light it must be further back, and, judging by the English experience, no upright position should be maintained within 800 metres, from which distance troops well trained in rifle practice should be able to obtain superiority of fire. *Under 800 metres*, open ground is practically as safe from assault as the well-flanked ditch of a fortress.

I should like to combat here a much-favoured idea, which says: "Let us train our officers and men to advance rapidly against the foe; the enemy's fire will soon put a limit to this when it comes to real fighting." This is fallacious.

Troops fight in action as they are taught in peace. They cannot instinctively adapt themselves to unexpectedly changed conditions.

The useless advance of the Austrians in 1866 was a case in point. Up to the present the English have not adapted their tactics to the annihilating fire of the Boers.* But to do this troops must be accustomed in peace to long-range fire. It is difficult to hit small objects such as men's heads in broken ground over 800 yards off, but that the eye can be trained to this is shown by seamen and sportsmen. Troops untrained to shoot at small objects at great distances will hit nothing in war. Once superiority of fire is obtained, it matters little in what form the assault is carried out. The enemy is entirely shaken, or he is not. In the first case, he retires. In the second, he remains lying down covered and firing. Then no assault should take place, but fresh troops should be brought up at once, and fire superiority first obtained.

Therefore, at peace-training, the umpires should decide which side has obtained the necessary superiority of fire, which is practically impossible.

To sum up the lessons of this war:—

The infantry fight of modern war is decided by superiority of fire. The bayonet attack must follow, but it only puts a finish on what is already done.

The small-bore magazine rifle demands early deployment and early superiority of fire. With good training this can be obtained from a distance of 800 metres.

Attempts to approach nearer till this is done lead to annihilation. It has long been recognised in Germany that purely frontal attack is

* See footnote on previous page.—TRANSLATOR.

impossible. The superiority of the attacker must be utilised to envelop the defender.

Lieut.-General Rohne has shown that this is not only decisive as regards its moral effect, but also materially. The earlier opening of fire by the attack facilitates this envelopment. Too close crowding of the firing line is undesirable,* but the deployment from the outset of superior numbers to obtain superiority of fire is necessary.

The principle of "depth fighting" is illustrated in an extraordinary manner on our parade grounds. Utterly inadequate forces are deployed at first in order to increase our losses at the last. Thus battalion after battalion might have suffered repulse, whereas a whole brigade, attacking simultaneously, might have been successful.**

The whole effort of the attacker must be directed to early envelopment of the enemy at long distances, bringing more rifles into play than he possibly can muster.

This principle is carried out in siege warfare. Who would think of keeping back a single gun on the chance of its being able to replace one put out of action? I know something is to be said on the other side, and it is only against the excessive retention of reserves that I protest.

If the attacker is stronger at the decisive point, he need not be stronger along the whole line to enable him to carry out these enveloping tactics. In future fights, the art will consist in holding the front, which will extend for miles, with the smallest force, while penetrating at decisive points in strength. The voices of those who insisted on awaiting the outcome of the artillery duel before advancing their infantry are silent.

General von Schlichting says that the passive awaiting this result by the Infantry is a mistake. Success follows on combined action of both arms from the very first. What would have resulted at Nachod, he says, if the Infantry had awaited the action of the Corps Artillery? This was done in the Franco-German War because our Artillery then was superior to that of the French and prepared the way for the action of our inferior infantry weapon. Now the Artillery on both sides will presumably be equal, and no one can foresee which will preponderate.

Though weapons have improved, the human eye remains the same, and observation at 3,000 metres and over is still as difficult as ever.*** The thick cloud of smoke caused by the black powder with which shrapnel is filled for observation purposes will hang about the objects, so that its effect cannot really be seen, and then nothing remains but distributing the rain of bullets all over, like water from a watering pot. This prevents rapid success.

The war in South Africa proves that this will often happen, as one hears of artillery actions lasting for hours, whereas according to the rules

* This seems to be borne out by the reports from Spion Kop.—TRANSLATOR.

** This picture might have been taken in England, and coincides with the views of many British officers of experience.—TRANSLATOR.

*** This is scarcely in accordance with recent experience. Telescopes and field glasses have also improved in power. The atmosphere is certainly very clear in South Africa.—TRANSLATOR.

of the practice ground, they ought to have been decided in a few minutes.

So Artillery preponderance may never be attained. Is no Infantry attack then to take place?

If no Infantry has yet been thrust into the fight it would certainly be useless to begin it now.

The Artillery will be so engaged with one another that the Infantry may well manage to advance comparatively unharmed. Therefore, "forward the Infantry," employing as many rifles as possible in an enveloping attack.

The Infantry must win their way by their own preparatory fire. All it can ask of the Artillery is to engage the enemy's guns. If they succeed in overpowering them, so much the lighter the task for the Infantry.* General Rohne whose book** has reached a third edition, says greater stress must still be laid on careful judging distance by officers at the longer ranges, and more attention to observation of results, to which N.C.O.'s and men of good sight should be specially trained.

The Editor recommends urgently the study of Colonel Cardinal von Widdern's IV. and V. volumes of "The War on the Line of Communications" of the German Army in 1870-71, published in 1899. It is to be noted that all the attempts of the French to interrupt the German communications succeeded, and that in those cases they captured the garrisons. They were also successful in surprising small railway station detachments, and in capturing trains. The surprised troops were moreover not always Landwehr, but in many cases Line regiments.

The commandants, etc., did not always sufficiently understand their business. That is because they had not studied military matters sufficiently in peace.

Colonel Cardinal von Widdern's book is admirable for this purpose, supplementing the official account, as it dwells only on examples that are of typical interest and instructive for all time. The part the initiative plays in all these affairs is prominently brought to the front.

(2) CAVALRY TACTICS.

The year 1899 was characterised by several new issues of Cavalry Drill, Germany, France, Austria (latter end of 1898), Russia (Cossack Lava), Italy, and Roumania having published new regulations for this arm.

These, however, make no important changes. The weighty reasons for the formation of permanent Cavalry Divisions are everywhere discussed. In Austria we hear regrets expressed regarding the want of co-operation with the other arms. In Russia this is also complained of, as well as the want of comprehension shown by the Cavalry of the working of the other arms.

* General von Schlichting's views seem to be gaining ground in Germany.—TRANSLATOR.

** *Das gefechtsmässige Abteilungschiessen der Infanterie. 3te Auflage.*—MITTLER, BERLIN.—TRANSLATOR.

If permanent Cavalry Divisions are not formed, then more frequent assembly of temporarily formed Cavalry Divisions will be required. The reduction of divisional Cavalry to less than 3 squadrons per Infantry Division, in order to strengthen the Cavalry covering the front, is a questionable measure. If the latter is beaten and thrust aside, the Divisions are deprived of their immediate protectors, which should secure the march of their column. This was shown by the manœuvres in Ireland, where hostile patrols succeeded in getting through.

The strategic uses of Cavalry, more important than ever, were often imperfectly fulfilled.

The distinct separation of reconnoitring and screening duties is demanded.

Messenger pigeons, the heliograph, balloons, cycles, and motors are now used in connection with this service. Cyclists are of value in sparing the horses, though they cannot, with bad roads and weather, replace mounted messengers.

The Austrian and French Cavalry Drill-books, especially the latter, indicate a desire to avoid fettering commanders by any planned method of Cavalry action, leaving the leaders of units to act according to the exigencies of the moment.

The Austrian and French mounted riflemen can hardly strengthen the Cavalry, even if they do not actually hinder it. Cavalry furnished with Q.F. field guns, machine guns, and good carbines, with more ammunition, should be independent of them.

Higher training in shooting and fighting, greater skill in dismounted action, carrying the carbine across the shoulder (as with other nations), lighter boots, and the replacement of the sword by a hunting knife, which can be fixed on the carbine, seem to be the chief requirements for the above purpose.

The fear of deterioration into mounted infantry, which is often expressed, shows a want of appreciation of the present conditions of warfare.

In Austria, France, and England, a tendency towards the lance as the arm of Cavalry is apparent.

At the manœuvres in Ireland the tendency to screen their own forces rather than reconnoitre those of the enemy, shows the necessity of separating these two duties.

The cyclists rendered excellent service.

The Indian manœuvres were more like real war, but many faults were committed.

The many defects of the English Cavalry peace-training bore fruit in war, and were not to be made good by brave charges.

At Omdurman the successful attack on the Dervishes was dearly purchased, owing to insufficient reconnaissance. In this combat, the dismounted action of the lancers from the rear of the enemy, when they had ridden through, is to be noted, thus driving them back by their carbine fire upon the British Infantry in support.

In South Africa, also, the reconnoitring has left much to be desired, but the difficult country, the bad condition of the horses owing to the sea voyage, want of food, the strange climate, etc., and the superior shooting of their opponents, who knew the country, added to the wretched weather, seem to have deprived the English Cavalry of all activity in scouting.

When reports are to hand, many valuable Cavalry lessons will doubtless be learned. The rapid occupation of important distant points, and the hasty strengthening of threatened points of attack, by taking up extended defensive positions, are among the dominant features of this war.

Austria-Hungary.—The Cavalry Drill of 1898 was completed by Part II. in 1899. In the attack on Infantry, the charge by successive squadrons, instead of as with us (Germany) by *échelons*, is recommended. Great stress is laid upon simultaneous attacks at different points, *e.g.*, it is advised to attack the head and tail of marching columns at the same time. Reports are not yet to hand of the Cavalry manœuvres at Păpa in 1899.

Russia.—The Cossack Lava was used for the preparation of great Cavalry attacks and to support the flanks in the great Cavalry manœuvres at Oran in September. On the whole, the attack in 3 *échelons* (Treffen) of large bodies did not succeed. (There were 9 Cavalry regiments in the Corps, so General Ssuchotin made one of his Cavalry Divisions attack the hostile Cavalry, another the Infantry, keeping the independent Cavalry Brigade in reserve.) The Cossack Lava manœuvres were generally considered too complicated.

(3) FIELD ARTILLERY TACTICS, 1898-99.

Ten years ago the year 1889 was characterised in these Reports as an important era in Field Artillery tactics. The reasons given were the introduction of smokeless powder, the re-organisation of our Field Artillery, its being placed under the Corps and Divisional commanders, and the issue of a new Artillery Drill.

In the "Reports" for 1889 it was considered that the following Artillery questions required solution:—

1. The retention of the "Corps Artillery," or its distribution among the Divisions.
2. The proper manner of the preparation of the Infantry attack.
3. The advisability or not of introducing Q.F. field guns.

In Germany these three questions have been solved—the third in 1897, the first two in 1899.

The new Field Artillery weapon is a compromise. It was seen that smokeless powder permitted quick-loading. Greater power was also given to the gun. The new 1896 gun has about 25 per cent. greater power than that of 1888. The weight behind the team is lightened 10 per cent., and many improvements have been made to facilitate more rapid aiming, to lessen the recoil, and so to increase the rapidity of fire. The shell weighs heavier than that of the corresponding French field gun, which is an advantage. It has less muzzle velocity, but that may also be considered

an advantage. Russia, Austria, and Italy have improved their guns, and are not likely in the immediate future to introduce new patterns. The second question has been answered by the field howitzer of 1898.

It is, however, to be observed that the new "Field Artillery Drill" lays down that it is by the simultaneous action of the Infantry, compelling the defender to occupy his position, that the Artillery action against the supporting points will be rendered most efficacious.

A Brigade-division of 3 howitzer batteries is to be added to each Army Corps, and in action attached to one of its Divisions.

A proportion of common shell is still retained with the field guns for the attack of entrenched positions.

Besides the above, the heavy 15-centimetre (6·9-inch), worked by the garrison artillery, are available. These are organised in batteries of 6 guns, 4 batteries forming a battalion.* All these are furnished with "time and percussion" fuzes.

The German Army is, therefore, better provided with artillery than any other Army. In France the 12-centimetre (4·7-inch) gun corresponds to it. It is classed as "heavy artillery," but it carries shrapnel. The "double shell" of the French field guns are only fired with percussion fuzes, and so are not suited or, indeed, intended for curved fire at objects behind cover.

Russia has introduced field mortars carrying shrapnel and common shell. These are similar to the German 15-centimetre in effect. The same may be said of the 12·7-centimetre (5-inch) howitzer. Austria had given its field guns "ecrasit bombs," but these are being replaced by 4·7-inch howitzers. It is not known yet whether Italy has now high explosives with time and percussion fuzes.

The abolition of the Corps Artillery in Germany was the outcome of a long-felt desire for better co-operation between the Infantry and the Artillery. There is no place for Corps Artillery in modern tactics, as this demands the early deployment of the whole of the guns. Should special circumstances require the formation of an Artillery reserve, the commander of the force can allot for the purpose a portion of the Artillery of that Division which he keeps in reserve. For instance, the Howitzer Brigade division could be so employed. But this might not be convenient, as the Division which from its position would best form the reserve might have no howitzers with it. It would be better, therefore, to form a fourth Howitzer battery, so that a Brigade-division of 2 batteries could be attached to each Infantry Division. Then no common shell need be carried for the Field Batteries.

The issue of new "Regulations for Artillery Fire" and a new "Field Artillery Drill" in Germany (August, 1899), as well as in France in 1899, are matters of general interest. The new German regulations were necessitated by the introduction of the new field guns, viz., the Field gun of 1896 and the Field Howitzer of 1898. The battery now consists of 6 guns and 6 wagons, but the chief changes are in the method of ammunition supply.

* These would be classed by us as guns of position.—TRANSLATOR.

The Field Howitzer battery is to have in war 6 guns, 6 ammunition wagons (instead of 9), and 2 supply wagons.† The fighting line consists of 6 guns and 3 ammunition wagons; the regimental transport consists of the other 3 ammunition wagons, 1 supply wagon and the led horses. The remainder form the "heavy baggage." Instead of the former 2nd Line Transport, each Infantry Division has 2 light ammunition columns, and each Cavalry Division one. The Infantry column consists of 18 carriages.

The attack of the howitzers in action is to be supported by the field batteries with their common shell, which is to be changed to shrapnel directly the enemy show themselves; and, as before said, great importance is attached to close co-operation with the Infantry.

In drill especial stress is laid upon the necessity for increasing rapidity in the manœuvring of Horse Artillery. As heretofore, only two batteries are attached to a Cavalry Division, not, as some artillerists wished, three.

"The French Field Artillery Drill" says nothing about the new gun, the short 12-centimetre (4·7-inch). From this it is concluded that it is intended that this should belong to heavier position artillery, drawn by stronger teams with drivers on foot. The French drill contains model instructions for the reconnaissance and occupation of positions, and details of the methods of training *éclaireurs* and *agents de liaison* are given.††

Great Britain.—The battle of Omdurman was the first occasion when smokeless powder and high explosives were used on a large scale in war. The number of rounds expended is remarkable—500 per battery in 2½ hours, nearly as much as by us at Vionville in 10 hours.

As regards the effect on entrenchments of their Field howitzers, that on the Boers trenches has not been, according to present accounts, very great.

ENGINEERS AND FIELD FORTIFICATION.

The South African War shows that the effect of small arms, compared with artillery, has always been underrated. It seems, as far as can be judged from the reports of the correspondents, which are one-sided and wanting in clearness, that even in the case of provisionally fortified places, such as Ladysmith, Kimberley, Mafeking, even heavy artillery was not able alone to bring about a decision, and that it was not the artillery but the infantry fire which repelled the assaults. From this it may be inferred that in improvised fortification the chief thing is careful selection of ground and in well-arranged infantry positions, and that the absence of bomb-proof cover may be redeemed by mobility.

† This question of the number of guns in a battery may have been thus decided because the rapidity of fire of the converted guns was considered insufficient to admit of their reduction to four, or on the score of expense. The question is still being considered in France.

In Russia, the reduction of the 8-gun batteries to 6 guns each is much discussed.

†† A comparative study of the French, Russian, and German Field Artillery Drill-books is to be found in the *Neue Militärische Blätter* for December, 1899.

Theoretically, after the war of 1877-78, field fortification was given a high place in military art. Since then the great improvements in weapons of offence discounted this. From the experiments in 1898, where a defensive position at Donaueschingen was bombarded, it was concluded that nothing could live under the fire of field howitzers, which crumpled up heavy bomb-proofs, etc., and that none but men of iron nerve could stand the terrorising effect of these terrible shells. But however great the material damage, the experiences of actual war in 1898 and 1899 do not bear out the theories formed from peace experiments.

These wars have, however, shown the necessity for the training of the troops in skilful entrenching, and, at the same time, to the giving up of the fruits of their labour without a murmur on its being ordered in accordance with tactical exigencies.

The defence of positions, both by Boers and British in the South African War, shows the value of the skilful use of ground. Though European Armies are not likely to adopt Boer tactics, yet there is much to be learned from their skill in defence.

The main point is the offensive spirit they showed, both as regards choice of ground and in their use of it when on the defensive. The Modder and Tugela showed their appreciation of a frontal obstacle, and their occupation of the Hlangwane Hill showed them ready to adopt the principle of offensive flanks. In all their operations they strove to surround their enemy. Their movements at Belmont, Graspan, Estcourt, show them withdrawing their centre and pushing forward the wings. Their principle has been offensive strategy and defensive tactics, without, in the use of the latter, giving up the initiative whereby they compelled the enemy to conform to their movements. The English since the arrival of General Buller acted almost entirely on the offensive. But where the English acted on the defensive, as at Kimberley, they seemed tied to their field-works, whereas the Boers gave theirs up directly the situation demanded it.

The strength of the Boer defensive appears to have lain chiefly in the great use they made of rifle fire, but they were careful not to expose the defenders on the crests, but pushed them far down the slopes, and often forward in the plain below, as at Magersfontein, seeking, above all, to avoid all dead ground, and to sweep that at decisive distance with a searching fire. They replaced the advantage of the natural obstacle which the crest offers by constructing artificial wire entanglement obstacles under close fire. Their artillery were chiefly posted on heights behind the first line of the infantry, and so withdrawn from observation and fire. They often reserved their fire for close ranges, when, coming as a surprise to the attackers, it caused them much loss.

They constructed no redoubts, and made little use of farmsteads for defence, these being too conspicuous.

The slight effect of the artillery action on the defence is noteworthy. This holds good for both sides, which does not accord with peace experiments. The English artillery is of modern type, and we expected great results from it, but only occasionally did it cause much loss, and in no cases was its effect sufficient to render possible the infantry assault.

On the contrary, the Infantry fire of the defence is shown to have enormous effect.

It is true that European troops will not advance to the attack in the close formations adopted by the English, but even against thick swarms of skirmishers the effect will be so annihilating that frontal attack without cover is impossible.

The attack will take the character foreshadowed by General von Schlichting.

Small detachments creep forward, taking every advantage of the ground, to seize some position in advance, as a sort of first parallel, under cover of which the great deployment can take place. To attain superiority of fire, a nearer position, 600 to 700 metres from the enemy's position, must be seized with the aid of entrenching. Even then it is doubtful whether the defenders will quit the position, unless the assault, with its costly sacrifices, follows, especially if the defenders have the strength and spirit to make counter-attacks.

The attack on a prepared position cannot be carried out in a single day. The deployment of the artillery, the overpowering of the enemy's guns, the seizing of advanced positions, the overwhelming of the defence by Infantry fire, and the assault, will take days; so that the process will resemble that of the attack on a fortress.

In any case, it is evident that all troops must be more highly trained in the use of the spade, which is as necessary for attack as defence.

ARTILLERY MATERIAL, 1899.

Germany.—The Krupp Q.F. field gun is of 7.7-centimetre (3.03-inch) calibre, and is made of nickel-steel. It has 32 parallel grooves. It carries fixed ammunition, the outer casing being of brass. It can fire 4° right or left of the line of fire without trailing. Length about 6 feet 8 inches, weight about 7.7 cwt. It fires over 312 inches. The limber is chiefly of steel. It fires both shrapnel and common shell with time and percussion fuzes. The shrapnel contains 300 leaden bullets of .35 oz. each, its weight being 15 lbs. It can fire about 8 rounds a minute. The total weight of the gun with carriage is about 34 cwt. That of the H.A. gun is about 33 cwt.

The field howitzer has a calibre of 4.1 inches and is 8 feet 11 inches long. It fires a common shell and shrapnel. The former weighs 35 lbs., the latter containing 500 bullets and weighing 31 lbs. Its total weight is about 38 cwt. The battery carries altogether 192 common shell and 326 shrapnel.

The heavy batteries of the field army are armed with the 15-centimetre (5.9-inch) howitzers and the 21-centimetre (8.2-inch) field mortar. These are position guns. Details of these were given in the February (1900) number of the JOURNAL, p. 156. The heavy 12-centimetre (4.7-inch) gun carries common shell weighing 34.4 lbs., and shrapnel of 42 lbs. weight.

Machine guns of Maxim construction are being experimented with.

France.—The Q.F. field gun of 1897 has been supplied to the field batteries, but the H.A. gun is not yet settled. The calibre of the field gun is 7·5 centimetres (2·95 inches), the breech-action being similar to that of the Belgian Nordenfeldt. It fires shrapnel, melinite, and common shell of about 13·75 lbs. weight.* The muzzle velocity is about 1,640 foot-seconds.

Great Britain.—The Report speaks favourably of the performances of our 5-inch howitzers in South Africa,** and gives details of the various British guns used, which are well known to our readers. It points out the want of guns of position necessitating the borrowing of naval guns from the war-ships.

Russia.—No decisive steps have yet been taken in regard to the new field gun, but some Krupps have been under trial. Some details are given of the Inspector-General of Artillery Engelhardt's new gun, which is said to be capable of firing 16 rounds a minute.

Switzerland is still engaged in trials of Q.F. field guns, experiments being conducted with Krupp and other guns.

The Transvaal.—Guns were purchased in Germany, France, and England. From the first-named were bought 7·5-centimetre (2·95-inch) Q.F. field guns, 3·7-centimetre (1·45-inch) mountain Q.F., and 12-centimetre (4·7-inch) field howitzers, and 15·5-centimetre (6-inch) position guns, not quick-firers. As far as one can judge, the field guns have proved too heavy for transport, and the fuzes were defective. The 6-inch position gun fires common shell weighing 87 lbs. The shrapnel, with 480 lead bullets, 90 lbs. The fuzes were defective. From England came a few Maxim 7·5-centimetre (2·95-inch) Q.F. field gun, and a greater number of 3·7-centimetre (1·45-inch) automatic Maxims (pom-poms). There were some 6·88-centimetre (2·7-inch) Krupp mountain guns of old pattern. The Orange Free Staters had some 7·5-centimetre (2·95-inch) Krupp guns.

The United States are still experimenting with Q.F. field guns, chiefly of 3-inch calibre.

The Editor again gives a list of works dealing with artillery, chief among which will be noticed "Quick-firing Guns," by Wille, Berlin, 1899; the "Tactics of Field Artillery," Rohne, Berlin, 1899 and 1900; and the papers of Colonel T. Schott in the military journals and periodicals.

SMALL ARMS, 1899.

The outcry raised by England against the non-stopping power of small calibre in order probably to conceal the deficiencies of the Lee-Netford has been proved by the Boer War to be fallacious, and the superiority of the German Mauser of 7-millimetre (·276-inch) calibre carried by the Boers proved.

Germany.—Why, then, does Germany still retain her 7·9-millimetre (·311-inch) calibre? It is simply a question of expense. The rifle is

* Some details of the French Field guns (12½-pounders) have since been given in the *XIXth Century Magazine* for November, 1900.—TRANSLATOR.

** This, it will be noticed, is not in accord with the Report on Field Artillery, Tactics, and on Engineers.—TRANSLATOR.

retained in order to use up the enormous quantity of ammunition in store. Besides, the new weapon of the German Army (of 1898) is ballistically one of the best. It has an improved barrel of the same calibre as the '88 pattern, but a new "Mauser" magazine arrangement, and there are several other improvements.

The German officers are armed with the *self-loading Mauser pistol* 7·63-millimetre (·300-inch) calibre, of which the fixed magazine carries 10 rounds. At 10 metres distance it penetrates 10 inches of fir. Its point-blank range is 500 metres, and with hardened bullets it shatters the bone terribly. It weighs $2\frac{1}{2}$ lbs. and fits into a wooden holster forming a stock if required.* The *Bergmann Automatic Pistol* (model '97) has also been tried by the Government with favourable results. Its calibre is 7·65 millimetres (·301 inch). It has a detachable magazine which carries 10, 20, or 30 cartridges. It has, like the Mauser, a case which forms a stock, and at 20 metres it penetrates $11\frac{1}{4}$ inches of fir. It can fire 120 shots a minute, and is of simple manufacture, easily taken to pieces and put together.**

France.—In France Captain Daudeteau has designed a self-acting magazine rifle of 6·48-millimetre (·254-inch) calibre. The magazine is so constructed that the soldier can replace singly any cartridge that is expended, so that the magazine always remains full for emergency. The locking arrangement is on the bolt principle. A patent device prevents any possibility of double loading. The sword-bayonet or dagger slides vertically under the barrel. It is said to have a flat trajectory up to 600 metres, and such penetrating power that at 200 metres it pierces nearly half-an-inch of mild steel and 5 feet of fir.***

Trials are being carried on with this weapon, which some think will replace the Lebel Rifle.

Spain.—The "Spanish Mauser," as it is called, because the Spanish soldiers used it in the late American-Cuban War, is the weapon chiefly carried by the Boers. Its bore is 7-millimetre (·276-inch) and it shoots with great accuracy. It has been said to cause but slight wounds. This is not so, but owing to the small orifice made by the bullet on entering the body, the wound is easily bound up until proper medical treatment can be administered. An American war correspondent thus relates his feelings on being struck by a Mauser bullet:—"I suddenly felt a blow in the back, "which was neither severe nor painful, but as if some one had given me a "slight knock. I fell down, however, and could not stand up. Shortly after "the surgeon came and pronounced me mortally wounded. This no more "impressed my mind than the wound did my body. I attribute this to the "fearful shock the bullet caused. Later I came to myself and felt as if red- "hot needles were being driven into my spine from its base right to my "brain. I afterwards found that this arose from the bone splinters

* This can be obtained at the A. and N.C. Stores. Price 5 guineas.—TRANSLATOR.

** This can be obtained at the A. and N.C. Stores. Price £5 7s. 6d. with pouches, etc.—TRANSLATOR.

*** The *Armée et Marine* of the 2nd April, 1899, gave fuller details with drawings of this rifle.—TRANSLATOR.

"penetrating the marrow of the spine. While my observations in the field "and in the hospital led me to conclude that the Mauser bullet is one of "the most merciful invented, yet it must be observed that anyone wounded "by it is immediately disabled for the time."

Turkey.—The armament of the troops of the Line with their Reserves and Landwehr in the 1st, 2nd, and 3rd Army Corps was completed with the 7·65-millimetre (·301-inch) Mauser in the spring of 1899.

United States.—The reports of the Cuban Campaign Committee regarding the performances of the 7·62-millimetre (·300-inch) Krag-Jørgensen Rifle are satisfactory. The chief defect is its being a single-loader. An improvement is being designed whereby the magazine will be enabled to be recharged by a simple motion. A new sight has been invented and applied to this rifle to counteract the drift. These weapons are also being supplied to the Navy, and in November, 1899, the "Kentucky" and "Kearsarge" were provided with them. The use of black powder in Manila led to heavy losses by the Americans.

It is probable that the Mauser self-loading pistol may be supplied to the Army.

Belgium.—The *Revue de l'Armée Belge* describes minutely in its July-August number a new magazine rifle constructed by Henri Pieper, gun-maker, of Liège. It brings to notice the following points in the new rifle as distinct improvements:—

1. The arrangement of stocking the barrel, of which the breech end is quite enclosed, thus obviating any special hand-grip protector.
2. The arrangement of the magazine.
3. The arrangement of the bayonet, which influences the correctness of the shooting. It lies in a groove under the barrel, and needs only straight pushing forward when required for action.
4. An improved back-sight.
5. The mechanism of the magazine. This resembles that of the Norwegian Krag-Jørgensen.
6. A special arrangement which prevents the possibility of the cartridge being fired until the breech is completely closed.

Its calibre is ·303 inch (7 millimetres), 4 grooves; weight, with bayonet, 8·8 lbs.; length do., 5 feet; number of rounds in magazine, 6; muzzle velocity, 2,328 foot-seconds; number of rounds fired per minute, 25; range, 4,000 metres.

Part II. ends (commencing at p. 443) with a valuable summary of the most noteworthy military publications during the end of 1898 and 1899. This is in addition to a short list of works bearing on each subject at the end of the section treating of that particular branch; but, as it alone extends to over 30 pages of the length of those of the JOURNAL, it is regretted that it is impossible to do more than refer the reader to it in the original. It also summarises what the Editor considers the most important articles in the German *Militär-Wochenblatt*

and its literary supplement for 1899, as well as the Berlin *Neue Militärische Blätter* and some other foreign periodicals. Of the British accounts of the Soudan Campaign, it mentions Steevens's "With Kitchener to Khartoum" and Alford and Swords's account.

PART III.

HISTORICAL RÉSUMÉ, 1899.

In Part III. of the Report, the historical section, a short account of the doings of the German colonial forces in East Africa and in the Cameroons is given. The expedition in February and March, 1898, against the Hottentots in South-West Africa, under Major Moeller, is also narrated, and the comparative heavy loss is commented on. A summary of the Spanish-American War of 1898 by sea and land, illustrated by small outline sketches, is added, and an epitome of the Soudan Campaign of 1897-98 is continued from the von Löbell's Report for 1896, which included the re-occupation of Dongola, and is carried down through the Atbara and Omdurman campaigns and the battle of Khartoum to the pursuit and death of the Khalifa Abdullah at Om Debrikat on the 23rd (? 24th) November, 1899. The writer makes very few comments on this campaign.

THE BOER WAR.

It is otherwise with the Boer War. This is treated at great length, but with an animus against the British which deprives the account of much of its value, especially as the facts on which it is founded have in many cases been incorrectly ascertained. For instance, in the footnote to p. 510, regarding the action at Majuba Hill in 1881, which is stated to be the cause of the Boers being granted their independence, it says that 200 Boers climbed the mountain which General Colley had occupied *with a large force*, and defeated him, with a loss of 90 dead, 133 wounded, and 57 prisoners, while they (the Boers) had only 2 killed and 4 wounded.

Now, the numbers the British had at Majuba are well known, and might easily have been correctly ascertained and quoted.

The writer prefaces his account by saying that in the nineteenth century no such unjustifiable war as the present Boer War was ever waged. Essentially the cause lay in the fact that it was known that the longer it was put off, the stronger would the Boers become, so the English first tried intimidation, and then to delay the outbreak of war until the Transvaal could be surrounded by British troops and overwhelmed, if it did not surrender.

"This was, however, averted by Kruger's determined action."

The Report adopts the estimates given of the Boer strength at the beginning of the war by the *Militär-Wochenblatt* as about 64,000 men. That of the *Cape Times*, 87,000, it considers exaggerated.

It puts Sir Redvers Buller's forces at about 19,000, Lord Methuen's at 12,000, Gatacre's and French's at 10,000, and Sir George White's at 9,000. Total, 50,000.

But by February, it states, the whole force was increased to about 150,000 men.

The Report describes, with small-scale sketches in the text, the theatre of war from Douglas on the west to the seaboard on the east, and from the Cape to the Limpopo and Rhodesia on the north.

It gives the original strategic positions and plan of campaign of the Boers as follows, quoting from Johannesburg sources :—"At Volksrust "and on the Sandspruit about 12,000 men are assembled; at Vryheid about "3,000. From Lydenburg 3,000 are marching on Volksrust. The com- "mandoes at Potchefstroom and Rustenburg, 7,000 strong, are watching "the western border. On the northern frontier the commandoes of "Waterberg and Zoutspanberg are in readiness. Our plan is very simple. "As soon as the Free Staters on the Natal border near Harrismith are "assembled and ready, an ultimatum will be sent to England, demanding "the immediate withdrawal of the British forces. Two days after the "despatch of this telegram, our main force will advance by Volksrust, "and the Free Staters by Harrismith. The Vryheid Commando will "hold the Zulus in check, and with part of its strength will also advance "on Dundee. The Western Commandoes will drive the enemy out of "Mafeking and Kimberley, and then, moving north to join the "commandoes on that frontier, will occupy Rhodesia."

The Report describes, with dates, the well-known events of the war from the time General Joubert was appointed to command the Transvaalers, and General Prinsloo the Free Staters in Natal. The latter, it states, came through Botha's Pass. Others came through the Tintwa Pass and occupied Bester's Station. It attributes General Meyer's defeat at Dundee to the non-arrival of the Free State Commando under Erasmus, which lost its way in a fog. This mist also favoured Colonel Yule in his retreat from Glencoe by Beith to Ladysmith, which they could easily have cut off, had they known of it, by occupying the pass of the Biggarsberg, north of Helpmakaar. Yule's troops were completely exhausted and demoralised. The fight at Eland's Laagte is stated to have been fought by the Boers under Kock, with 1,500 men only and 2 guns, against 4,500 British under French, with 18 guns, and the Boers held their own for four hours. The death of General Kock is stated to have been caused by his shameful treatment. The British victory was gained at great cost and no fruits were reaped. General French is blamed for incautiously following up the withdrawal of the Boers at the fight on the 29th (? 30th), whereby Sir George White was forced to denude his centre of troops under Hunter to support him. This caused the left wing (!) to be lost sight of, and it was forced to capitulate, and Ladysmith was forthwith invested. On 22nd November 600 Lancers made a sortie on a Boer post of 25 men. This was reinforced by 200 men, who surrounded and shot all the Lancers except 5 (!) This report is from Boer sources. The well-known chief events of the war are narrated. The Modder Bridge and Magersfontein battles, the Stormberg disaster and the Colenso repulse are dwelt on. This is attributable, the Report says, to the admirable patience of the Boers in reserving their fire, and to their skill in concealing their men in well-

chosen defensive positions. Their precautions in always having a clear field of fire, burning the veldt where required for this purpose, are much praised.

As regards Spion Kop, the British are stated to have strongly entrenched themselves, and the Boers to have successfully assaulted their first parallel (!) The renewed attempts of Sir R. Buller to advance to the relief of Ladysmith, and the diversions by General Barton, are briefly narrated down to 8th February, and the movements of Lord Methuen and Major-General MacDonald on the Modder, to divert the attention of the Boers from the great concentration of troops by Lord Roberts, are described; but, like an experienced writer of sensational stories, the Editor breaks off at the most exciting part.

As the Report, though dealing with the events of 1899, narrates some of the events of this war which occurred in February, it is to be regretted that the account was not carried down to the end of that month. This would have completed an important period, as the relief of Kimberley by General French on the 15th, Lord Roberts' successful advance and capture of Cronje and his force on the 27th, Sir R. Buller's relief of Ladysmith on the 28th, and other minor British successes, had, by that time, changed the whole aspect of the war.

The Report was probably not sent to press till March, so this might, perhaps, have been done.

THE BOMBARDMENT OF PARIS IN 1870-71, AND THE REASONS WHICH DELAYED IT.¹

Translated from the "Internationale Revue über die gesamten
Armeen und Flotten."

THE *Militär-Wochenblatt* lately published a remarkable epitome of the work of General von Blume, "Die Beschiessung von Paris, 1870-71, und die Ursachen ihrer Verzögerung," from which we extract the following:—

"Everyone remembers the popular song in which Moltke was reproached for his delay in commencing the bombardment of Paris. The German people, whose patience was sorely tried by the daily telegram "Before Paris: Nothing New," roughly exclaimed that they were tired of waiting. It was also believed that the Chancellor, himself so active, was indignant with the slowness of the siege, which paralysed his political action. Nobody could understand how it was that Generals, who had taken prisoners an Emperor and whole armies, who had surmounted great difficulties with comparative ease, could not make a fortress submit, which, although large, was only defended by popular masses militarily organised. It was consequently surmised that there must be some hidden reason for this state of things. And the German people, who are not generally distrustful, brought themselves to believe that the personages at the head of affairs had some private motive for thus acting. It was in this way that the legend arose of the intervention of the English ladies who, it was said, had entreated their husbands in high places to protest in the name of humanity against such an act of barbarism as the bombardment of "The Mecca of Civilisation," of "Paris the Sacred," would be.

The official historian took no trouble seriously to contradict this legend, so it continues to exist, although there was no foundation for it, and from time to time it re-appeared in the Press, embellished with new details and accepted with pleasure by those who took delight in disparaging persons of high rank of their own country. For some people prided themselves on reproaching military chiefs like Moltke, Blumenthal, and even the Commander-in-Chief of the IIIrd Army, for having weakly yielded to sentimental women and the suggestions of foreigners, and for having neglected to act as the exigencies of the war and their duty to their country required.

A writer of authority has at last been found to refute these accusations, which has not been done up to the present, and to absolve the memory of our heroes from this stain. For other reasons it was high

¹ *Die Beschiessung von Paris, 1870-71, und die Ursachen ihrer Verzögerung*, by von Blume, General of Infantry and Head of the Infantry Regiment Herwarth von Bittinfield. No. 13. (Berlin, 1899. Mittler and Son.)

time the work was done, because General von Blume is one of the small body of survivors who was in a position to follow completely and very closely the course of events before Paris.¹ It is probable that he would not have departed from his reserve but that some recent publications have insinuated that even Bismarck and Roon believed there was some foundation for the reports according to which the supreme command of the German Armies was subject to foreign influences. It became, then, a matter of conscience for the author to contribute on his part whatever might help posterity to fix the responsibility which lay on those who had any part in that complex affair. He has been unable to avoid stating that the imperious and commanding will of Bismarck was in part responsible for the dissensions, which were apparent in the Grand Head-Quarters Staff, but he has done it in so delicate a manner as in no way to diminish the respect which every German feels for the memory of the old Chancellor. Von Blume displays an absolute impartiality with regard to all the important matters on which he touches. The statement of the relations subsisting between Bismarck, Roon, and Moltke during the three wars brings to light some facts unknown until now, or which have passed unnoticed.

General von Blume demonstrates the correctness of his assertions and proves so conclusively that the delay in carrying out the bombardment of Paris was due to serious causes, that we are quite convinced there is no necessity to seek for occult reasons for these events. In view of its importance, it seems to us of general interest to give a condensed *résumé* of the brochure in question.

This *résumé* is, however, not intended to render superfluous the reading of the brochure itself:—

“The author commences by pointing out the position which Moltke held at head-quarters and his relations with the King; and to do this he has to go back some years. In 1864, when Bismarck and Roon were already very important political personages, Moltke—although called to the head of the General Staff by the King, who had a high appreciation of him—was, comparatively speaking, unknown to both the Army and the country. Moreover, the importance of the position of the head of the General Staff had been much lowered during the long period of peace. The holder of the appointment could not report directly to the King, and could only communicate with him through the Minister of War, von Roon. This state of things lasted during the war with Denmark. Roon made all reports, and transmitted the orders to the Commander-in-Chief of the Army of Operations. In order to keep himself somewhat in touch, and have something to go upon for the advice he was frequently called upon to give, Moltke had resource to the expedient of maintaining a private correspondence with Blumenthal. When, after the capture of the Düppel lines, the King repaired to the field of battle to salute the troops, von Roon, not Moltke, was chosen to accompany

¹ General von Blume served as a Major on the Head-Quarters Staff, and was Chief of the Bureau of Operations, all important papers passing through his hands, and he was held in high esteem at that time by Moltke.

him. It was only on the 1st May, when, as the Chief of the General Staff, he was attached to the Commander-in-Chief, that he had an opportunity of showing his qualities; but, on the other hand, he lost the modest place which he had previously held in the Council of the King.

At that time, from the point of view of the conduct of the operations, Moltke only occupied a secondary place by the side of Roon, and the whole war, owing to the number of political considerations which had to be taken into account, tended to make the post of the Minister for Foreign Affairs the most important. And nothing was lost by this; the solution of the Schleswig-Holstein question by Bismarck was a master one. If policy and the conduct of operations constantly agreed, it was because the friendship of Bismarck and Roon, founded on a mutual esteem, contributed much to this accord.

It resulted that in the following war, Moltke could only acquire little by little the position which he ultimately attained. Nevertheless, from the preparatory epoch, he played a *rôle* quite different from that of 1864, and starting from the 2nd May, 1866, the Chief of the General Staff definitively took the place of the Minister of War in all that concerned the orders to be given to the armies in the field. Thus the duties of each of these three personages were settled in a rational manner. But the successful issue of the war depended in 1870, as in 1866, on a proper accord between them. They had to act upon the principle of assisting each other, while avoiding meddling in each other's business. Moltke faithfully followed this principle, which, as far as the second requirement was concerned, came easily to him owing to his natural reticence; von Roon tried to act similarly, in effacing himself as much as possible. Bismarck alone, owing to his impulsive character, did not always confine himself to his proper sphere of action. If it is true that policy determines the final object of the war, the Commander-in-Chief ought, nevertheless, always to have an entirely free hand in the choice of means for ensuring victory.

The short duration of the war of 1866 contributed to maintain harmony. It was only with the commencement of the peace negotiations that differences of opinion showed themselves. Bismarck's solution, however, in spite of the views of the soldiers, was soon unanimously approved.

The war of 1870 commenced at a time when the most complete accord reigned between these three grand men. Unfortunately, the relations between the Chancellor and the General Staff soon became strained and little by little an acute conflict was brought on. The first cause of disagreement was probably due to the fact that Bismarck was not allowed—as in 1866—to help with the reports that the heads of the Army made to the King; but as this was his Majesty's decision, on his own initiative, he doubtless had good motives for his action. There are many reasons why all military affairs should be looked into in the presence of the Chief of the State. But to have obtained a complete accord it would have been necessary that, as Bismarck had helped with the drawing up of the reports to the King in 1866, so Moltke on his side should have been kept *au courant* with all diplomatic action. Now,

that was not done in 1866, and, had it been, it would most probably not have suited Bismarck's designs. But in the state of things which existed, political action could easily be made to dominate military authority, and this it was absolutely necessary to avoid. In addition to this as opposed to the political situation, which existed both in 1864 and in 1866, the outlook was altogether clear and without complications, and in view of the rapid march and success of the operations, no political crisis was to be feared.

Contrary to old traditions, Bismarck was not kept informed of what was going on by the heads of the military departments, and this he considered an insult. "Under these conditions," says Blume, "each of those small and miserable details which are bound to crop up in time of war contributed to the aggravation of the conflict." But the author considers rightly, that the real cause of the Chancellor's annoyance was due to the fact that during the Franco-German War, he had a far less important *rôle* to play than in the two preceding wars, and also during peace-time; so that while military events of the highest importance were taking place, the consuming energy of the Chancellor had no means of being satisfied. The *rôle* of mere spectator, which was enforced upon him during the time that he was before Paris, became altogether insupportable, and when the legend was born which has given rise to so much discussion, he was just in the temper to give credit to it. The real motives for the delay in commencing the bombardment remained unknown to him, since he was not in touch with the heads of the Army, and his relations with Moltke were very strained.

That which is additionally astonishing is that Roon himself, who was fully informed as to the causes of the delay, gave some credence to the legend. General von Blume cannot explain this in any other way than from the fact of the severe illness from which Roon suffered during November and December, and which had attacked the mental faculties of the minister. Von Blume is of opinion that Roon would have changed his mind if he had been aware of the correspondence carried on by Moltke in 1870-71, and which has since been published; he is also confident Bismarck did not see it.

It is on this correspondence that General von Blume relies above all to lay bare the events which passed before Paris, and, in addition, to give everyone an opportunity of judging for himself, he has published also the document on which he bases his conclusions.

There were three different methods of reducing Paris :—

1. Famine.
2. Bombardment.
3. Methodical attack of the forts and the "enceinte."

Famine had given the wished-for results at Metz, and it promised to succeed even better in the case of Paris. It was very difficult to estimate the quantity of provisions that there were, but people competent to judge were of the opinion that they would not suffice for more than ten weeks. On this point they were deceived, as in the same manner they erred as to the

degree of resistance offered by the French—and it was a very pardonable error. It was decided, then, to reduce the town by famine, but precautions were taken from the first should this course prove inefficacious. So early as the 9th September Moltke transmitted an order from the King to the Minister of War enjoining him to send to Paris, with all possible speed, the most powerful and the greatest number of siege guns obtainable. Also to complete the blockade, inspector-generals of Artillery and Engineers were ordered to submit plans for a general attack. In their report of the 30th September they proposed to make a regular attack from the south-west front, combined with a sham attack from the north-west. These proposals were approved by the King on 2nd October, and the general commanding the IIIrd Army Corps was instructed to make the necessary preparations and carry out the attack. To procure the *matériel* necessary for the siege, however, more time was required than had been anticipated, and this, although they had taken into consideration the fact that they had only a single line of railway at their disposal.

The Minister of War recommended at the latter end of October that the artillery attack should be hastened, and in his reports to the King at the end of November, he expressed his fears in very distinct terms. The Chancellor backed his warning by a note in which he pointed out, that these delays were producing the most disastrous results, as much in Germany as abroad. The result of these discussions was to greatly disturb several high personages of sometime.

There was no divergence of opinion on the subject of attacking Paris by the artillery, and Moltke himself was in favour of it from the beginning to the end of the siege. He was only in doubt as to whether this attack was necessary before Paris surrendered of herself. This hesitation, in so simple a matter, to take a decided line, has given cause, to those who did not know the real facts, to doubt the character of Moltke, which was essentially a strong one. It was decided to begin the attack as soon as the necessary preparations were made, although there was not perfect agreement as to the exact plan. Moltke, the Commander-in-Chief of the IIIrd Army Corps, and the generals of the various armies engaged foresaw that an attack in force was necessary. For this, a concentrated artillery fire was required against the heavy cannon used by the French (it was afterwards known that they had 600 guns engaged), which had to be put out of action. Moltke then thought—and nothing afterwards changed his opinion—that he was only in a position to open fire when he had a sufficient number of guns at his disposal, together with a plentiful supply of ammunition. On the other hand, the German press being very impatient, advised Bismarck and Roon to begin the bombardment of the interior of Paris. The Parisians, they said, were already so crushed by the miseries which they had had to endure, that the increased sufferings which a bombardment would cause would in itself speedily bring their resistance to a close. To obtain their surrender fewer guns and munitions of war would have sufficed. There was no doubt whatever amongst the German Head-Quarters Staff as to the right of bombardment according to

the rules of war, but they had grave doubts as to its success, and upon this point General von Blume expresses himself lengthily.

At the express instance of Roon himself the King summoned, by an autograph letter of the 28th November, the Chief of the General Staff and the Minister of War and ordered them to justify the delays which had taken place in the preparations for the attack, and to find a remedy for the situation. On the 30th November, General Moltke wrote a memorandum in which he made known the reason of the delay in the arrival of the *matériel* necessary for the siege, and what measures he proposed taking to hurry it forward.

About this time important events at the seat of war in the provinces occurred. The Army of the North had been defeated on the 27th November at Amiens; the Army of the Loire on the 28th at Loigny-Pompry, Orleans soon followed, and the "supreme effort," Champigny before Paris, came to nothing. After these events one can well believe that the power of resistance on the part of the enemy was weakening, and Moltke was of opinion that it was only necessary for an event, more or less important, such as the surrender of the forts, for example, to occur, to lead to the capitulation. In his memorandum of the 30th November, he restricted his propositions to this point, apparently rejecting the idea of a final attack. One must not lose sight, therefore, of this point of view of his, when one examines the circumstances which occurred before Paris.

It was in consequence of this train of circumstances that the King decided in the early days of December to begin an artillery attack on the south front, where the first train of ammunition had already arrived, and where a regular reinforcement of supplies would be assured. But he also proposed as a secondary action to bombard the town. The necessary preparations were to be pushed on with the greatest possible activity, always taking precautions to be able, if necessary, to press the attack up to the capture of the principal "enceinte." In spite of all these efforts the attack on the south front was not begun until the 5th January. General von Blume has given us a very clear and concise account of this. Neither the bombardment nor the regular attack hastened the surrender of the place. It fell on the 26th January, 1871, principally by reason of the stock of provisions coming to an end and the failure of all the efforts to raise the blockade.

From all we can gather, the march of events would not have been altered if the bombardment had commenced sooner. But if a regular attack had been begun at the end of October—and with sufficient *matériel*—the fall of the city and the signing of peace would probably have been brought about a month or six weeks sooner, and, as far as one can judge, without any greater losses. The question, then, of discovering if the preparations for the regular attack could have been hastened, gains greatly in importance. On this also one hears from many sources that the delay had been tolerated and desired.

Nevertheless therein lies the most difficult side of the situation. It was necessary to bring 300 heavy guns for the main attack and 2,500

tons of ammunition. The Authorities had at their disposal the Nancy-Toul-Reims railway which at the same time was the sole line of communication of the besieging Army until when they were able to assign to the Army of the Meuse a branch line of this railway. But in spite of this, that line accomplished the task with great rapidity in that which concerns the transport of the guns. The difficulty, above all, was in the transport by road from those points where the lines terminated—Nanteuil (100 kilometres), after that Loigny (50 kilometres)—as far as Villacoublay. It fell to the lot of the Commander of the IIIrd Army Corps to be responsible for this transport. The roads, which were very hilly, were good to begin with, but by reason of the traffic consequent by the war, and, in addition, owing to the heavy rains which fell in November and December, they soon fell into a very bad state.

To transport all the *matériel*, thousands of strongly built carriages were requisitioned, drawn by powerful horses. As no preparation had been made for this in peace-time, it was necessary to supply their places by other means of locomotion. It is interesting to read in General von Blume's brochure what steps were taken to procure these substitutes.

The Minister of War gave orders on 3rd December for the mobilisation of columns of carts and wagons to carry the munitions of war, and these were organised after military fashion. No one knew, even he himself was ignorant, of the difficulties which shortly presented themselves, or he would have been able to take measures with greater alacrity, after Moltke's report on the 9th September. These columns began to arrive at Paris towards the end of December and commencement of January. After the battle of Orleans they were also able to make use of a certain number of ammunition wagon teams, and in accordance with orders from head-quarters the Ist and IIInd Army Corps requisitioned nearly a thousand horses equipped to draw four-wheeled wagons.

It was in this manner that they were enabled to accomplish so gigantic a task.

The reader has some right to ask why Roon—who had persistently required the Quarter-Master-General to use haste, did not bring his own influence to bear in order to lighten the difficulties. Von Blume supplies the obvious reason in the fact that the Minister for War was unable to do so, owing to the complaint from which he was suffering. And if Moltke was unable to take an active part in this, von Blume rightly observes, it was because, in the first place, his whole attention was absorbed in the events which were occurring in the provinces, away from Paris, and also that he purposely avoided interfering in matters which concerned Generals with independent commands.

Von Blume makes a note of the fact that it would have been of advantage if Moltke had made in this case an exception to the ordinary precedent.

General von Blume concludes by hoping that he has succeeded in proving that the delay of the attack on Paris clearly explained itself without any suggestion that "certain personages, forgetful of their duty, had yielded to foreign influences which were inimicable to the true

interest of the Fatherland." This proof the General has fully established, and the Army should, once and for all, be truly grateful for the fact that the question as regards the bombardment of Paris is now settled, and also by reason that an unjust suspicion has now been dispelled from the reputation of a man who was ever the greatest figure of that Army."

NAVAL NOTES.

HOME.—The following are the principal appointments which have been made: Rear-Admirals—L. A. Beaumont to command of Australian station; A. K. Bickford, C.M.G., to command of Pacific station. Captains—R. A. J. Montgomerie, C.B., to "Prince George"; C. J. Baker to "Blake"; C. R. Keppel, C.B., D.S.O., to "Warspite"; A. J. Horsley to "Magnificent"; J. Ferris to "Empress of India"; F. G. Kirby to "Devastation"; F. S. Inglefield to "Glory." Commanders—J. de C. Hamilton to "Defiance"; T. D. Napier to "Peterel"; M. T. Parks to "Blanche"; H. Evans-Thomas to "Pioneer"; C. Sclater to "Condor"; E. J. Bain to "Raven"; M. Culme-Seymour to "Coquette"; H. Grant-Dalton to "Bellona"; A. P. James to "Panther."

Rear-Admiral L. A. Beaumont has been transferred from the Pacific to the Australian command, and he is succeeded by Rear-Admiral A. K. Bickford, C.M.G., who has selected Captain Colin Keppel, C.B., D.S.O., as his flag-captain. The new first-class battle-ship "Glory" was commissioned at Portsmouth on the 1st inst., for service as flag-ship in China, where she will relieve the "Centurion." The second-class cruiser "Gladiator" commissioned at Portsmouth on the 3rd ult. for service in the Mediterranean, and left on the 18th ult. for her station. The second-class cruiser "Amphion" left Plymouth on the 9th ult. to relieve the "Leander," a sister-ship, in the Pacific. The second-class cruiser "Sybille" commissioned at Portsmouth on the 9th ult. for the Cape and West Coast, where she relieves the third-class cruiser "Barrosa"; she left for her station on the 26th ult. The third-class cruiser "Pallas" commissioned at Portsmouth on the 12th ult. to relieve a sister-ship, the "Pearl," on the North American and West Indian station, and left on the 26th ult. for her destination. The third-class cruiser "Blanche" commissioned at Devonport to relieve the third-class cruiser "Magicienne" on the Cape and West Coast. The first-class cruiser "Europa" paid off at Portsmouth on the 23rd ult. The first-class cruiser "Blake" was commissioned on the 30th ult. at Portsmouth for relief service, and she will convey a new crew to Malta for the first-class battle-ship "Renown," which is to re-commission at that port. The second-class cruiser "Astræa" was last month suddenly detached from the Mediterranean station for temporary service in China and has arrived at Hong-Kong, convoying the torpedo-boat destroyer "Janus." The third-class cruiser "Pioneer" is to be commissioned for service on the Mediterranean station, where she will relieve the torpedo-gunboat "Hebe." The new sloop "Condor" is to be commissioned for service on the Pacific station. The "St. George," with the broad pennant of Commodore Winsloe, and the "Juno," two of the cruisers of the Training Squadron, have left for a cruise in the Mediterranean, and are temporarily attached to Sir John Fisher's command, where later they will be joined by the other two ships of the squadron. The first-class belted cruiser "Immortalité" is to be attached as a sea-going tender to the Sheerness Gunnery School.

The Reserve Squadron.—This squadron assembled on the 5th inst. at Portland for a month's cruise under the command of Rear-Admiral Sir G. Noel, K.C.M.G., in accordance with a new Admiralty scheme, under which the squadron will be

mobilised three times a year for tactics and combined exercises, instead of only once, as has hitherto been the case. The squadron consists of the following ships, which have all been brought up to their sea-going strength :—

First-class battle-ships—"Trafalgar," "Nile," "Sans Pareil."

Second-class battle-ships—"Alexandra" (flag), "Thunderer," "Howe,"

"Rodney," "Camperdown," "Benbow," "Collingwood," "Colossus."

Armoured cruisers—"Australia," "Galatea."

Second-class cruisers—"Melampus," "Severn."

First-class torpedo-gunboats—"Alarm," "Circe," "Onyx," "Leda,"

"Spanker," "Renard," "Speedwell," "Skipjack."

Steam Trials.—The new sloop "Shearwater" has been completing her trials satisfactorily. The following are the particulars of the 30 hours' steam trial at five-sevenths H.P.:—Pressure of steam in boilers, 206·1 lbs.; ditto in engine-room, 183·6 lbs.; vacuum, 25·65 inches; revolutions, 175·9 per minute; I.H.P., high 307·6, intermediate 332·1, low 384·8—total, 1,024·5; coal consumption, 1·73 lbs. per I.H.P. per hour; speed, 12·85 knots. The trial was satisfactory, the machinery and Belleville water-tube boilers working well throughout.

The following are the results of the eight hours' full-power trial :—Pressure of steam in boilers, 226·8 lbs.; ditto in engine-room, 200·8 lbs.; vacuum, 23·5 inches; revolutions, 194·2; I.H.P., high 430, intermediate 461·3, low 541—total, 1,432·3; coal consumption, 1·57 lbs. per I.H.P.; speed, 13·5 knots. The contract with the Thames Ironworks and Shipbuilding Company specified for 1,400-I.H.P.

The following are the particulars of the coal-consumption trial of the "Vestal," sloop, lately carried out in the North Sea :—Draught of water, forward 10 feet 4 inches, aft 13 feet; pressure of steam in boilers, 205·6 lbs.; ditto in engine-room, 183·6 lbs.; vacuum, 27·46 inches; revolutions, 161·3 per minute; I.H.P., high 198·3, intermediate 256·6, low 291·4—total, 746·3; coal consumption, 1·82 lbs. per I.H.P. per hour; speed, 10 knots. The trial, which lasted nearly 60 hours, was ordered to be made at half-power (700-H.P.) to ascertain the coal consumption on an extended run with 35 tons of hand-picked Welsh coal. The whole of the boilers were used (four Belleville boilers with economisers). The coal consumption was somewhat higher than was anticipated, which is accounted for by the I.H.P. not being an economical one for the whole of the boilers, and also by the high funnel draught, the weather being very boisterous during a considerable portion of the trial. The "Vestal" is ordered to carry out another trial of a similar character, except that Welsh coal as supplied to ships for ordinary service will be used, the object of the trials being to ascertain the difference per I.H.P. in the consumption of hand-picked and ordinary steam coal.

Return of Prize Firing for 1899.—Beginning with the firing from guns of the largest calibre, we find that 13 battle-ships, armed with 16·25-inch and 13·5-inch B.L. guns, competed under the usual regulations, i.e., range from 1,400 to 2,000 yards; speed, 8 knots; time of firing, two runs of six minutes each. These vessels mounted in the aggregate 48 of the largest guns, from which a total of 252 rounds were discharged. The total number of hits scored was 84, which is equivalent to 33·3 per cent. In the previous year the percentage was 29·96, so that the shooting with these large calibre weapons has distinctly improved. The best practice was made by men of the port guard-ship "Nile," who scored 14 hits in 23 rounds; the worst was by the "Sans Pareil," which made 1 hit in 8 rounds.

Coming next to the 12-inch guns of various patterns, nine quite modern battle-ships and two older ones competed. The modern ships, of the "Majestic" and "Hannibal" types mounted 36 of these weapons, fired 187 rounds, and scored 63 hits. The average of hits was thus 33 per cent., or no higher than the average of the larger guns. The best shooting was made by the "Victorious" and "Cæsar," which tied with 11 hits in 21 and 20 rounds respectively, the worst ship being the "Magnificent" (Channel Squadron), which scored only 2 hits in 17 rounds. There

is a vast difference here in the shooting, and it must be said that nearly all the ships of the Channel Squadron made indifferent practice with these 12-inch guns. The "Majestic" scored but 3 hits in 20 rounds, the "Mars" 5 in 25 rounds, and so on. The "Victorious" (China station) was a smart gunnery ship in the previous year, and has maintained her reputation. Five battle-ships, armed with 10-inch guns, fired considerably better, scoring 63 hits in 185 rounds, or just one hit in every three rounds. The firing of the "Thunderer" was very rapid, being 47 rounds in the 12 minutes allowed, out of which as many as 27 hits were scored. This is a very fine result, and reflects credit upon the officers and men. The "Barfleur," on the other hand, fired only 24 rounds in the same time and with the same number of guns, and only one shot in six was a hit. The average results with these 10-inch guns were good, and an improvement upon those of the previous year.

The next table gives the firing from cruisers, fourteen in number, carrying 9·2-inch and 8-inch guns. Practice was made with 35 of these weapons, which fired 288 rounds and scored 100 hits. In 1898 the shooting from these guns was good, the average of hits being 43·6 per cent. This year the average sinks to the low level of 34 per cent. Three cruisers—"Royal Arthur," "Severn," and "Theseus"—scored only 2 hits apiece with three guns in 8, 14, and 13 rounds respectively. The "Magdala" fired as many as 38 rounds in the 12 minutes, scoring 13 hits; but this vessel carries four guns, as compared with two by most of the others included in the list. Only two ships—the "Comus" and "Sphinx"—fired with the 6-inch non-quick-firer.

Coming to the returns for the 6-inch Q.F. gun, which is our standard weapon for secondary armament in battle-ships and the chief armament in cruisers. Here, of course, the results are very important, as forty ships fired with these weapons, in all parts of the world and under the same rules. The range is limited to 1,600 yards, the speed fixed at 8 knots, and the time allowed is one run of six minutes. These guns, to the number of 307 (5 less than in 1898), fired a total of 2,347 rounds, and scored 664 hits. The percentage of hits was, therefore, 28, which is the same as in the previous year. Practice was made with a much larger number of the 6-inch Q.F. guns than in the previous year, viz., 202, as compared with 133. The number of rounds fired was correspondingly larger, but no material improvement in the average can be recorded. They fired 1,227 rounds, and scored 345 hits—an average of 28 per cent., which is the same as for the other type of 6-inch gun.

With the lighter guns—such as the 4·7-inch of Ladysmith fame—the firing was good, as it usually is. There was, however, no material improvement. Some 27 commissioned ships of all classes did not compete at all.

Prize-Firing in Channel Squadron.—The practice for this year has now been completed, and the results, compared with those for 1899, have been collated by a correspondent of the *Times*, who says:—The only ship that more than doubled her previous record was the "Majestic," which last year made 3 hits in 20 rounds, whereas this year she scored 12 hits for 28 rounds. Much of the credit for this performance is due to the captain of the starboard after turret gun, who fired 5 rounds in 3 minutes, this being half the prescribed time, and each round hit the target. The following figures will show that so far as the 12-inch gun is concerned there has been no appreciable improvement on last year's prize-firing:—This year the "Prince George" fired 23 rounds and made 7 hits. She made the same number of hits last year with 18 rounds. The "Mars" made 6 hits for 25 rounds, against 5 hits for the same number of rounds last year. The "Hannibal" scored 5 hits in 18 rounds this year, against 6 hits for 27 rounds last year. The "Jupiter" showed a considerable falling off, for while this year she made 4 hits in 16 rounds, last year she made 8 hits in 21 rounds. Both this and last year the "Magnificent" hit the target twice with 19 and 17 rounds respectively. There is, however, a general, and in some instances a conspicuous, improvement in marksmanship when we come

to the 6-inch Q.F. gun, and it is to this weapon that the gratifying returns are mainly due. The "Majestic" made 52 hits for 108 rounds, against 28 for 97 last year. The "Prince George" did better still, for 93 rounds produced 52 hits, against 100 rounds and 20 hits last year. This year the "Jupiter" fired 106 rounds and made 44 hits, whereas last year she made only 27 hits with 98 rounds. The "Resolution" fired 76 rounds and made 31 hits, whereas last year she struck the target 22 times out of 79 rounds. The return from the "Repulse" showed the marksmanship to be almost stationary, for while this year with 72 rounds she made 27 hits, last year she scored 26 marks with 73 rounds. Last year the "Magnificent" hit the target 32 times in 102 rounds, this year 30 times in 87 rounds. The "Mars" in 95 rounds scored 27 hits, against 19 hits for 80 rounds last year, and the "Hannibal" 27 hits for 79 rounds, against 19 hits for 104 rounds last year. It will thus be seen that whereas last year the 8 battle-ships fired 733 rounds and made 193 hits with the 6-inch Q.F. gun, this year in 716 rounds they made 290 hits. From the return, as a whole, it is satisfactory to find that, whereas this year the average rounds per gun per minute were 3.89 with 1.58 hits per minute, the respective figures last year were 3.98 and 1.05.

Some interesting long-range firing was lately carried out by the "Majestic" off Berehaven. The "Furious" early in the morning towed the target out (100 feet long by 25 feet high). The battle squadron and the cruiser "Diadem" weighed at 7.30, and steamed out through the eastern entrance. When a few miles out the target was moored so as to lie broadside on to the "Majestic," which stopped her engines when about 9,000 yards off. The first division arranged themselves to the westward on a bearing at right angles to the line of fire of the "Majestic" on commencing, at a distance of 2 miles from the target. The second division was in the same order, but to the eastward. The firing was then carried out as follows, with 12 and 6-inch guns, at a speed of 15 knots:—

1. Preliminary shot at 6,000 yards, ship stationary.
2. Attacked target for 4 minutes, steaming towards it, opening fire at 6,000 yards with the target bearing 45° before the beam, firing in all 4 rounds from her turret and 25 rounds from her 6-inch guns (her main deck 6-inch did not bear until the last minute and a half of the firing).
3. Attacked target right ahead, opening fire at 6,000 yards with foremost turret and 2 foremost upper deck 6-inch guns for 3 minutes only, firing in all four 12-inch and twelve 6-inch.

The remainder of the squadron, which were lying with engines stopped, had 7 registering officers, each officer only recording the rounds within the special limit detailed to him for number of yards over or short. Each officer had to send in a return to Vice-Admiral Sir H. Rawson with his captain's remarks on the result of the firing. Sir Harry Rawson took his station on the fore bridge, with his flag-captain alongside, watching with keen eye the result of each shot. During the second trial the canvas target partly tumbled down, having been pierced 4 times by 6-inch shot and once by 12-inch. The actual result and reports will probably be made known only to the Lords of the Admiralty, but it is believed Sir Harry is much pleased on the whole with the trial.

All trials were finished by noon, when towing targets were put over and firing carried out with 6-inch guns, expending part of the quarter's allowance of ammunition, at 2,000 yards at a speed of 10 knots.—*Times and Naval and Military Record.*

FRANCE.—The following are the principal appointments which have been made: Capitaines de Vaisseau—E. M. J. Lamson to "Jemmapes"; E. M. Le Léon to "Brennus"; A. M. Thierry to "Courbet." Capitaines de Frégate—A.

M. F. Ytier to command of *Défense-Mobile* at Toulon; A. J. Bouxin to "Mytho"; A. L. Huguet to "Ibis"; P. L. Dejean to "Durance"; P. M. Vincent to "Styx."—*Journal Officiel de la République Française*.

On handing over the command of the Mediterranean Squadron to his successor, Vice-Admiral Fournier issued the following very characteristic Order of the Day to the Fleet:—"It is with profound emotion, tempered, however, by the consciousness of having done my duty, that I am leaving the post of battle which I have held during the last two years at the head of the Mediterranean Squadron. But it is with legitimate pride that I hand over to my distinguished successor, Vice-Admiral de Maigret, this important fleet in a perfect state of efficiency, trained in all exercises, prepared for all the possibilities of battle, for all the sacrifices the country can demand from it, and animated by the highest spirit of discipline and patriotism.

"It is to you all, admirals, commandants, officers, petty officers and men, it is to the co-operation of your limitless good-will, to your indefatigable endurance, to your incessant efforts to make progress, than I owe this supreme satisfaction, as I also owe to you every time during my holding of the command, that I have had occasion to congratulate you on the successful carrying out of manoeuvres, of your firing exercises, and on the success which has always crowned the missions confided to us.

"I can say to your praise that I have never known as your head either difficulty or mortification until the moment of that sad catastrophe which has recently cast a sombre veil of mourning on the lustre which you have given to this magnificent squadron. But disconcerting and grievous as this sudden blow of fate, of which the sea guards the secret, has been for us, it has not deterred us from incessantly and vigorously carrying out those exercises by day and night, where, profoundly penetrated by the sense of our duty to our country, we face together greater risks in order to attain an ever-increasing degree of perfection, taking us a step nearer to victory. It is, then, as true sons of France, as tried seamen, and skilful tacticians, and as men ready for battle, that I now salute you for the last time, offering you my homage and my affectionate remembrances with my best wishes for your future."

There is no doubt that the squadron is in a very high state of efficiency, and it is considered that Vice-Admiral de Maigret will not find it an easy task to maintain it at the present pitch of excellence to which his predecessor has brought it.

The bursting of a boiler tube on board the destroyer "Décidée" off Wei-Hai-Wei on 7th October was the cause of a serious accident to two of the crew, who were badly burnt and eventually succumbed to their injuries. A boiler-tube accident also took place on board torpedo-boat No. 184, near La Rochelle on 24th October, by which two stokers were badly burnt.

Notes in the Dockyards—Cherbourg.—The first-class battle-ship "Hoche," having completed her trials, is to be commissioned with a reduced complement, and it is expected that she will take the place of the "Amiral-Duperré," which ship is to receive new boilers and have her armament modified.

The new torpedo-boat destroyer "Espingole," having completed her trials, has been commissioned for service with the Mediterranean Squadron. As soon as ready she will leave for her destination, calling at Brest, from which port she is to convoy the torpilleur-de-haute-mer "Turco," which is under orders to join the *Défense-Mobile* at Bizerta; the "Espingole" is to relieve the "Chevalier" in the squadron, an older vessel of a much smaller type. The trials of the new torpedo-boat destroyer "Pique" have not yet been successful: although the engines worked well, yet with 288 revolutions the speed of the ship is only 24.5 knots; it is believed the screws will have to be changed. A sister vessel, the "Épée,"

built at the same yard, has also commenced her trials; as soon as they are concluded she is to proceed to the Mediterranean, where she will take the place of one of the torpedo-boats in the squadron. Instructions have been given to complete as soon as possible the repairs to the torpedo-destroyers "Lance" and "Salve"; they are vessels of an old type with locomotive boilers, which are now to be replaced by small-tubed water-tube boilers of the Normand-Sigaudy type, with which it is hoped they will regain their old speed, which, however, is only 19 knots.

As the Coast-defence Battle-ship Squadron is now to be permanently attached to the Channel, with its head-quarters at Cherbourg, orders have been given to transfer to this port all the stores and spare equipment for these ships from Toulon. The *Yacht* complains that no torpedo-boats or destroyers have yet been attached to the squadron, and is of opinion that, in view of their low free-boards and not particularly good sea-qualities, it would have been wiser to keep them in the Mediterranean, to which station for that very reason they were some two years ago transferred. On the other hand, the *Yacht* admits that there are several channels and anchorages on the Northern coast, especially in Bretagne, where the large battle-ships cannot enter, but which these ships can well defend in war-time.

Brest.—Owing to the increase of the fleet, the accommodation both in the dockyard and harbour is proving quite insufficient, and it is becoming daily more necessary to press on the extension works. The lengthening of the large breakwater and the preparations for constructing new docks at Lannion are to be taken in hand as soon as possible. The new submarine boat "Français" is to commence her trials this month; her sister ship, the "Algérien," is also nearly ready.

The new cadet sea-going training-ship "Duguay-Trouin," having completed the trials of her machinery and the 4-inch Q.F. guns, mounted for instructional purposes, the cadets have taken up their quarters on board her, and she is to leave immediately for her winter cruise to the coast of South America and the West Indies.

The first-class battle-ship "Amiral-Duperré" when relieved by the "Hoche" is to be placed in the Second Category of the Reserve, as well as the surveying-ship "Chimère," and the third-class cruiser "D'Estaing," which is returning from the East Indies.

The second-class cruiser "Catinat," on board which Capitaine de Vaisseau Kiesel has hoisted his broad pennant as senior officer in command of the Indian Naval Division, has had her commissioning trials before leaving for Madagascar, which were considered very unsatisfactory; the "Catinat" is a comparatively speaking new ship, with a nominal full-speed of 20 knots, but on a 24 hours' run at natural draught she only averaged 13 knots, and at her two hours' full-speed trial 17 knots; this result is considered disappointing.

The new first-class battle-ship "Iéna" is now approaching completion, rapid progress having been made with her lately; the armour of her heavy turrets is now all in place, and her 12-inch guns have been mounted. These guns are to form the armament of all the new battle-ships, taking the place of the 14.5-inch and 13.3-inch guns which are still mounted in some of the older ships. The turrets and ammunition hoists of the "Iéna" can be worked either by electricity or hand.

The second-class cruiser "D'Assas," which left Toulon on the 1st October, arrived here on the 8th, to join the new light division of the Squadron of the North.

Lorient.—The new torpilleur-de-haute-mer "Trombe," launched last July from the Chantiers de la Loire at St. Nazaire, arrived here on the 26th September. On her first trial trip, when proceeding at a speed of 23 knots, she struck with great force on the rocks near Port-Melitt. Immediate assistance was sent from the

harbour, and she was safely brought back into port. Naturally she has sustained serious damage, her fore part for about 30 feet being doubled up, while several plates in other parts of the hull are badly damaged, but the rest of the hull seems to be uninjured. An enquiry is being held; as the rocks are well known, and she had a pilot on board, while the officer in charge was himself well acquainted with the coast, it is difficult to understand how the mishap occurred. The "Trombe" has a displacement of 181 tons and a speed of 26 knots. It is calculated that it will take quite six months before the repairs are effected, as the new nickel steel plates required cannot be manufactured in less than four months.

The second-class cruiser "Isly," senior officer's ship on the Newfoundland and Iceland Fisheries, with the transport-avis "Manche" employed on the same duties, has arrived, and both ships will be placed in the Second Category of the Reserve for the winter.

Progress is being made with the first-class armoured cruiser "Amiral-Gueydon"; she is at present in dock having her rudder, screws, and under-water torpedo-discharges fitted. Her engines are almost completed, and it is fully hoped that she will be ready for her trials early in the new year. Her four funnels will be fitted into position in a few days. The work of completing the first-class protected cruiser "Jurien de la Gravière" is also being pushed; her boilers are in place, and the work of erecting her machinery is proceeding so satisfactorily that it is hoped she will be ready for her trials by next spring.

M. Grahay de Franchimont, the civil engineer attached to the Ministry of Marine, has arrived at Lorient to discuss with the naval authorities questions connected with the important works to be carried out for the improvement of the harbour and dockyard. Altogether a sum of 1,350,000 francs (£54,000) is to be expended, and it is hoped the work will be completed in 1903. The sum voted will be expended on:—

1. The deepening and widening of the channels of Lorient so that a division of cruisers can be accommodated in the roadstead.
2. The lengthening of Dock No. 2 to 520 feet.
3. The improvement of the local coal-dépôt and wharves.

Rochefort.—The transport-avis "Vaucluse," which was commenced some years ago, but on which all work has been continually stopped, is at last to be taken in hand, and should be launched early next year. The third-class cruiser "Troude," forming one of the Atlantic Squadron, has been paid off and placed in the Reserve, her place being taken by a new ship, the "D'Estrées." There is only one ship at present under construction in the yard, the first-class armoured cruiser "Duplex."

Toulon.—The first-class battle-ship "Brennus" and the third-class cruiser "Lavoisier" have been placed in the Second Category of the Reserve. The transport "Mytho" has been fitted out as a hospital-ship for service with the fleet in Chinese waters.

The system of training pilots for the Mediterranean torpedo-boats has again been modified. Originally there were three schools at Toulon, Corsica, and Algeria, the first two encroaching the one on the other. Then one school was formed, in which the pilotage of all three coasts was to be taught; attached for some reason at first to the Mediterranean Squadron, it was next placed under the superintendence of the Maritime Prefect at Toulon. Now it has been decided to re-establish a separate school for the Algerian and Tunisian coasts.

The work of reconstructing the coast-defence ships "Indomptable" and "Caiman" is approaching completion, as far as the first-named is concerned, as she is to be ready for her trials by the 15th March. Both ships are to receive a new armament of heavy guns, which will consist of 27·4-centimetre (10·8-inch) guns mounted in closed turrets, one forward and one aft, instead of the two 42-centimetre (16·5-inch) guns, mounted in barbettes, which they formerly carried. The "Terrible," a slightly smaller ship of the same class, is to be commissioned to form one of the Coast-Defence Squadron at Cherbourg.

Revision of Signal Books.—A commission has been appointed under the presidency of Vice-Admiral Gervais, with Vice-Admiral Fournier, Rear-Admirals Roustan and Touchard, Captains Puech, Jauréguiberry, and Manceron as members, and Capitaine de Frégate Perrin as secretary, for the revision of the signal books in use in the French Navy, particularly of the tactical signals. This decision has been taken in view of the difference displayed in the tactics of the Northern and Mediterranean Squadrons during the combined manœuvres under Vice-Admiral Gervais last summer. A similar revision of tactical signals was made in 1891 by a committee under the presidency of the late Admiral Charles Duperré.

The Squadrons.—The Northern Squadron as now constituted consists of the following ships :—

First Division :—

First-class battle-ships — “Amiral-Baudin” (flag-ship of Vice-Admiral Ménard), “Carnot,” “Masséna.”

Second Division :—

First-class battle-ships — “Amiral-Duperré” (flag-ship of Rear-Admiral Duchaine d'Arbaud), “Formidable.”

Third Division :—

Coast-defence battle-ships — “Bouvines” (flag-ship of Rear-Admiral Mallarmé), “Jemmapes,” “Valmy,” “Tréhouart,” to be strengthened by the “Terrible” and the torpedo-depôt ship “Foudre.”

Cruiser Squadron :—

First Division :—

Armoured cruisers — “Dupuy-de-Lôme” (flag-ship of Rear-Admiral Gourdon), “Bruix.”

Second Division :—

Second-class cruiser — “D'Assas.”

Third-class cruiser — “Infernet.”

Torpedo-avisos — “La Hire,” “Cassini.”

Repeating ships — “Fleurus” for the Cruiser Squadron; “Cassini” for Commander-in-Chief.

Torpedo-boat destroyers — “Yatagan,” “Durandal,” sometimes attached to battle-ships, sometimes to Cruiser Squadron.

The proposal to form a new battle-ship squadron, with its head-quarters at Bizerta, has been temporarily abandoned, and the reconstitution of the Northern Squadron, as given above, is the result of the change of plans. It is, moreover, further rumoured that the Minister of Marine has it in contemplation to still further increase the Coast-Defence Squadron, constituting it a separate command, under a Vice-Admiral, so as always to have two complete squadrons in the Channel—one with its head-quarters at Brest, and the second at Cherbourg; on the other hand, it is stated that next spring the Coast-Defence Squadron will be sent back to the Mediterranean, and that Bizerta will then become the head-quarters of the Division. The transference of the stores and spare equipment of the ships from Toulon to Cherbourg would look, however, as if the stationing of the squadron in the Channel was to be permanent.

In the Mediterranean an accident has happened on board the first-class battle-ship “Saint Louis,” while an 18-inch torpedo was being discharged from a tube above water forward, where the vessel is protected by light armour. As the torpedo left the tube the air reservoir burst. Fortunately the explosion occurred outside the ship, but one man, an engineer, was struck by a bolt which was projected inwards. The pressure within the air reservoir is so great that an explosion inside the ship would have been a very serious matter.

Visit of Inspection by the Ministers of Marine and War.—The Ministers of Marine and War have been making a tour of inspection of the defences of Corsica and Tunis.

They left Toulon on the evening of the 11th October, escorted by a division of the Mediterranean Squadron under Vice-Admiral de Maigret, consisting of the first-class battle-ships "Saint-Louis" (flag-ship of Commander-in-Chief), "Charlemagne," and "Bouvet," the armoured cruiser "Chanzy" and the third-class cruiser "Galilée," the Minister of Marine embarking in the "Saint-Louis" and the Minister of War in the "Charlemagne," and some Senators and Deputies in the "Bouvet." Arriving the next morning at Ajaccio, the Ministers spent the day in examining the defences and the port of refuge for the torpedo-boats of the *Défense-Mobile*; fine as the bay is, it is so open that the place can never become more than a coaling station and an anchorage where a squadron can take refuge for a time, if necessary, under the guns of the land defences, which can be made to command the bay. It is proposed to mount heavy guns on various commanding sites and to increase the coal dépôt and the facilities for coaling. On the morning of the 13th the squadron proceeded to Bonifacio, where another careful inspection was made, as the result of which the Ministers have recognised the impossibility, owing among other things to the very restricted space in the harbour and the extremely narrow and difficult entrance, to make a naval station of it, except for torpedo-boats, for which it seems well suited. Returning on board before noon, the Ministers with the squadron next proceeded to inspect Porto Vecchio, but here again the result was unsatisfactory, the place proving quite unsuitable for turning into a strong naval port.

The report which the Ministers will undoubtedly make as to the difficulties in the way of creating in Corsica a strong naval base, especially available for either offensive or defensive purposes, will come as a keen disappointment to large numbers of Frenchmen, who have long been hoping to see a formidable *point d'appui* established there as a set off against the important and almost impregnable strategic position which the Italians have created at Maddalena on their side of the Straits of Bonifacio, and which is looked upon as a standing menace to Corsica and a veritable thorn in the side for French fleets operating anywhere in its neighbourhood.

Continuing their tour the Ministers arrived at Bizerta on the morning of the 15th, where they made a careful inspection of the new arsenal which is being constructed at Cidi-Abdahat at the head of the great inland lake, which makes Bizerta so valuable an acquisition as a naval base. The work of dredging out the lake to a uniform depth of 33 feet is in full swing, while a fair commencement has been made with the new buildings and the digging out of the first dock is also in hand. After a visit to the Bey, the Minister of Marine returned to Toulon, visiting Bastia and Calvi en route.—*Le Yacht, Le Temps, and Le Moniteur de la Flotte.*

RUSSIA.—The following appointments have been made: Vice-Admiral—Skrydlov has taken over the command of the Pacific Squadron, and has hoisted his flag on board the first-class cruiser "Rossia." Rear-Admirals—Diker and Rojestvenski have been appointed to the command of the Torpedo and Gunnery Training Squadrons of the Baltic Fleet, respectively; Captain Nebogatov, of the cruiser "Minine," to be assistant to the former, Commander Dabich, of the second-class cruiser "Afrika," to be assistant to the latter. Captains—Vishevetzki to "Dvienadsat Apostolov"; Skalovski to "Pamiat Merkuria"; Nelson-Hirst to "Admiral Kornilov"; Tarasov to "Sissoi Velikie"; Bronitski to "Imperator Alexander II." Commander—Dobrotvorski to "Giliak."

Naval Estimates.—The Naval Estimates for 1901 are for a total of 91,097,666 roubles (£14,575,628), divided as follows:—

	Roubles.	£
Ordinary Expenses	60,000,000	(9,600,000)
Increase in the number of scholarships in girls' schools	10,000	(1,600)
Strengthening the Fleet	16,000,000	(2,560,000)
Supplementary to the Ordinary Budget	10,000,000	(1,600,000)
Improving the harbour of Vladivostok	2,000,000	(320,000)
Expenses of Hydrographical Department	54,700	(8,752)
Improvements at Port Arthur	3,000,000	(480,000)
Expenses of Naval Administration in Kvantong District	32,966	(5,274)
Total	91,097,666	(14,575,626)

This is divided in the following manner:—

Expenses of Central and Local Staffs	2,351,128	(37,618)
Maintenance of Educational Establishments	1,132,767	(181,242)
Shipbuilding and Guns	37,568,222	(6,010,915)
Ships in Commission	20,387,803	(3,262,048)
Building	5,654,341	(904,696)
Surveying, and Lighthouses and Beacons	1,312,157	(209,945)
Current Expenses of Establishments	5,822,669	(931,627)
Pay of Seamen on Shore	10,396,190	(166,339)
Gratuities and Grants	1,385,278	(221,644)
Medical Department	1,203,777	(192,604)
Various Expenses	1,637,634	(262,021)
Works at Port Alexander III.	3,200,000	(512,000)
Expenses of exploring the sea routes to the mouths of the Yenisei and Obi	54,700	(8,752)
Expenses of Improving Vladivostok Harbour	2,000,000	(320,000)
Expenses of Equipment and improvement of Port Arthur	3,000,000	(480,000)
Total	91,097,666	(14,575,626)

The above exceeds the Estimate for 1900 by 10,469,651 roubles (£1,675,144).

The Estimate of 17,805,439 roubles (£2,848,870), for shipbuilding, coming under item 3, as given above, is sub-divided as follows:—

	Roubles.	£
Construction of Hulls	7,800,000	(1,248,000)
„ of Engines	5,300,000	(848,000)
„ of Armour	3,400,000	(544,000)
Arming and Equipping of Ships	1,000,000	(160,000)
Reserve Fund for shipbuilding Purposes	305,439	(48,870)
Total	17,805,439	(2,848,870)

The first item is again allotted as follows:—

Battle-ship "Borodino," building at New Admiralty Yard	800,000	(128,000)
Battle-ship "Orel," building at Galley Island	900,000	(144,000)
Battle-ship "Imperator Alexander III.," building at Baltic Works	1,400,000	(224,000)
Battle-ship "Kniaz Suvarov," building at the same	1,400,000	(224,000)
The Cruiser-despatch-vessel of 3,000 tons for the Pacific, building at Baltic Works	680,000	(108,800)

	Roubles.	£
The coal transport of 7,200 tons, building at the New Admiralty Yard	500,000	(80,000)
A battle-ship of the type of the "Admiral-General Apraxin" (5,000 tons), building at the same	450,000	(72,000)
An Imperial yacht of the type of the "Alexandra"	100,000	(16,000)
Two torpedo launches, 60 feet in length, for the safeguarding and conveying of the above ...	50,000	(8,000)
A cruiser of 6,250 tons, building at Nicolaev Dockyard	699,280	(111,885)
Six torpedo-boats of 350 tons, building at the same	300,000	(48,000)
A cruiser of 6,250 tons, building at the Lazarev Dockyard	699,280	(111,885)
A steam transport of 318 tons, building at the Sormov Works	3,440	(550)
Twelve torpedo-boats in sections for Port Arthur	318,000	(50,880)
Total	7,800,000	(1,248,000)

New Ships.—The following are the dimensions of the first-class battle-ship "Retvizan," which was launched from Cramp's Yard at Philadelphia on the 23rd ult. :—

	Feet.	Inches.
Length between perpendiculars	374	1
Beam	72	2
Extreme draught	27	3
Approximate displacement	12,700	tons.

Protection is afforded by an armour-belt with a maximum thickness amidships of 9 inches, tapering forward to 4 inches and extending from the ram to just abaft the after barrette, or about two-thirds the length of the ship; there is an armoured turtle-back deck 2 inches thick in the horizontal part and 4 inches on the slopes, which begins on a level with the upper edge of the belt and ends at the lower, as in the ships of the "Majestic" type; the belt has a depth of 7 feet 6 inches. There is a further coal protection of 10 feet, corresponding to 4 inches of steel, so the engines are well protected. Above the belt is a central casemate protected by 6-inch armour, while on the barbettes, one forward and one aft, the armour is 10 inches thick; the casemate is shut in fore and aft by athwartship bulkheads of 9 inch steel. All the armour is Krupp steel hardened by that firm's latest process. The armament consist of four 12-inch 40-calibre guns in the barbettes, with an arc of training of 340°, the turrets being worked by either electricity or hand; twelve 6-inch Q.F. 45-calibre guns, of which eight are mounted in the central battery, separated by 2-inch bulkheads, and with a training arc of 120°, and four in the superstructure above the redoubt, with a training arc of 180°, and protected by cylindrical shields; eight 3-inch Q.F. guns, four before and four abaft the central redoubt, and six more between the 6-inch guns on the superstructure, and two mounted on the deck above, one on each beam; twenty-four 3-pounder and six 1-pounder Q.F. guns distributed in different parts of the ship, six torpedo-tubes, one forward, one aft, and two on each beam. The normal coal supply will be 1,000 tons, but arrangements will be made for carrying 2,000 tons, which will give a radius of action of 8,350 miles at 10 knots and 3,000 miles at 18 knots. The engines will be triple-expansion, with twenty-four Niclausse water-tube boilers, which are to develop 16,000-I.H.P., giving 126 revolutions, and an estimated speed of 18 knots. She will have a complement of 750 officers and men.

A trial was lately held at the butts at Carnegie Works (in North America) of the armour plates intended for the battle-ship "Retvizan," under construction at the Cramp Works, these being 6 inches in thickness, 9 feet high, and 8½ feet broad. Five shots were fired with A.P. projectiles from 6-inch guns, the mean velocity being 1,905 feet per second. The third shot gave an energy of 2,553 foot-tons, but only penetrated 3½ inches. In the other cases the projectiles broke up, only producing unimportant erasions on the surface of the plate, which was nowhere cracked. At the fifth shot the projectile broke to pieces, and only starred the plate all over, making indentations in no case more than 1½ inches. The armour is for the casemates of the battle-ship.

The protected first-class cruiser "Bohatyr," under construction at the Vulcan Yard at Stettin, belongs to the same type as the "Askold" and "Variag," though with different armour. Her displacement is 6,500 tons, and her principal dimensions are:—Length at the load water-line, 428 feet 9 inches; extreme beam, 54 feet 1 inch; draught, 20 feet. The armament consists of twelve 6-inch Q.F., as many 3-inch Q.F. and six Hotchkiss guns, these being protected by armour of nickel steel, varying from 3 inches to 5 inches. There will be 6 torpedo ejecting-tubes, 2 being under water. The armoured deck varies from 1½ to 2½ inches. The twin screws are worked by 2 triple-expansion engines with 4 cylinders; the boilers are on the Normand system. The estimated H.P. should not be less than 19,500, giving a speed of 23 knots, engines and boilers being produced at the Works. The ordinary coal supply is 750 tons, though the bunkers can hold 1,100. Her complement, including officers, will be 580 men.

With regard to the three large torpedo-vessels "Osietr," "Kefal," and "Losos," under construction at the Forges et Chantiers de la Méditerranée, every endeavour is being used to combine great lightness with as much strength as possible, the method of securing the hulls, decks, and compartments, and the quality of the material, contributing largely to this result. All the outer sheeting and angle steel are made of a special nickel-steel with high resistance to explosives, the proportion of nickel being 4 per cent. In spite of the difficulty of working with this material the work has been done with great neatness. The sheathing is zinced under water and to a certain height above the water-line. Each of them carries five 47-millimetre Q.F. guns and one 75-millimetre gun with a shield, and they have 2 ejecting torpedo-tubes. They are to have 2 vertical triple-expansion engines, which are to be tested to a pressure of 22 kilogrammes to the square centimetre, and at full speed of 26 knots should develop a H.P. of 4,750 for the 2 engines at 310 revolutions a minute. There are to be 4 water-tube boilers of the Normand pattern to each. The pipes of the boilers are of the softest steel, without join. The hull under the boilers and engines has been strengthened with riders and specially strong timbers and keelsons. They are to be subjected first to an 8 hours' trial at 14 knots, with regard to the expenditure of fuel, and then as to the utmost speed they can attain for 6 hours, and the behaviour of the engines under a speed of 22 knots, and within two hours once again at full speed. The quantity of coal taken for the trip will be estimated for 950 miles at a speed of 14 knots, or 1,860 at 10 knots. Should they attain a speed of less than 26, but more than 24 knots, they may be accepted, but subject to a fine of 15,000 francs (£600) for every quarter of the first knot, and 25,000 francs (£1,000) for every quarter of the second knot. The torpedo-gear, guns, carriages, etc., will be sent from Russia. The total cost of each, including transfer and trial, will be about 1,500,000 francs (£60,000).

The second-class cruiser "Askold," which will shortly be taken over by the Russian naval authorities, is described as a commerce-destroyer of medium displacement, and a splendid specimen of that class. She is to attain a speed of not less than 23 knots, the engines to develop an I.H.P. of 19,000, with a displacement of about 5,900 tons. The Shipbuilding and Mechanical Engineering Society at Kiel is to pay a fine of 20,000 roubles (£3,200) for every quarter of a knot short

of the contract speed ; if less than 21 knots is made, but above 20, the vessel may be accepted subject to a penalty in addition of 80,000 marks (£4,000). The expenditure of coal per H.P. per hour is not to exceed 2 lbs. (English). The stability is to be tested by the firing of the guns at various angles. The cost of the hull and engines, the boilers being of the Tornkraft-Schultz pattern, is about 3,075,000 roubles (£492,000). The order was given to the Germania Yard early in August, 1898.

The Sormovo Company, on the Volga, is now nearly ready with a steel twin-screw cruiser called the "Astrabad," destined for service on the Caspian at Ashur-Ade. Her displacement is 430 tons, and her main dimensions are as follows :—Length, 125 feet at water-line ; beam, 22 feet ; depth of hold, 12 feet 6 inches ; mean draught at full loading, 7 feet 6 inches. She will be launched next spring, or, more properly speaking, floated. She has two cylindrical double-ended boilers, and two "compound" engines of 500-H.P., giving her a speed of 12 knots. Her armament will consist of four 6-pounder and four 3-pounder Q.F. guns. She has a ram strengthened with transversal bars for ramming purposes.

Economisers, it appears, are becoming quite out of favour in the Russian Navy, as they accumulate on their surface so much soot, which, being a bad conductor of heat, diminishes the steam-producing qualities of the boilers. To clean this away takes up too much time and trouble, and puts the ship out of line for too long. Moreover, it goes hand in hand with the diminution of the general heating area of the boilers with relation to the number of square feet that go to each I.H.P. After a searching examination from all points of view into the good and bad sides of the fitting of economisers, the question has been decided in the direction of their disadvantageousness, and accordingly none will be fitted in ships for the future.

Soon there will be commenced at one of the St. Petersburg docks the building of a training-vessel for the engineers and stokers of the Baltic Fleet. The plans are now in readiness, and the hull is to be built of Siemens-Martin steel, at a cost of 3,000,000 roubles. The existence of such a vessel is necessitated by the rapidly increasing staff of such officers, which makes it necessary that those training for it should be brought together on board a vessel especially fitted for the work. All the necessary apparatus will be provided for enabling the aspirants to learn the work, and the building of the vessel is a great proof of the improved condition of technical education, and there is no doubt that the money will be well spent. All sorts of experiments and trials will be able to be carried out on board, which will give a specially learned colouring to the instruction there given.

Steam Trials.—The first-class armoured cruiser "Gromoboi" was recently tried by the committee for taking over ships on the measured mile, the engines being put at full pressure for 6 hours uninterruptedly, and five series of diagrams taken, the result slightly exceeding the H.P. contracted for, viz., 14,500 indicated. All 3 engines left nothing to be desired in construction and putting together, a new departure of the Baltic Works, but unfortunately some quarter of an hour before the end of the trial the rod of the valve of the cylinder of mean pressure of the starboard engine snapped, and the trial had to be put a stop to before its time. The trial was carried out at normal draught and the mean speed of the cruiser by the bearings was determined at 20 knots.

The official trials of the engines of the first-class armoured cruiser "Peresviet," held under the auspices of a committee presided over by Rear-Admiral Diker, at full pressure on a 6 hours' trip showed a mean speed by bearings of 19.12 knots. The I.H.P. was, on an average of 5 series of diagrams, as follows :—

Port engine :—High pressure cylinder		...	1,292.10-I.H.P.
Mean	" "	...	1,616.48 "
Low	" "	...	1,728.84 "
Total..		...	4,637.42 "

Starboard engine, 4,445·11-I.H.P.; mean number of revolutions 101·6, with 143·7 lbs. of steam. Amidships engine, 4,692·84-I.H.P. The total I.H.P. for all 3 engines worked out at 13,775·37, or 725-H.P. less than required by the specification. This is accounted for by the irregular working of the boilers, but the engines, on the whole, worked well, which they did not do last year, there being a heating of the bearings. The average number of revolutions was 102 with 139 lbs. pressure in the engine and 165 in the boilers.

Squadron Helm Signals.—When ships are sailing in squadron or fleet, signals showing the direction they are steering are made in the day-time with red and green cones, and at night with similar lights. The former is displayed on the mast that seems most convenient. It should consist of two cones suspended below the yard to right and left. The green on the right has its apex upwards, and the red on the left its apex downwards. The latter should consist of two ordinary lanterns with an electric light at the arm of the main yard in the same order. When the rudder is at least 10° to the starboard, the red light should burn up, and correspondingly the green light. As regards the cones, they should be hung on the same rope, the end of which is made fast to the wheel or tiller in such a way that when the helm is put to starboard the right cone may go down, and the left up, and *vice versa*.

Meaning of Signals.—Rudder straight, when both cones are on a level. Rudder to port, ship turns starboard, when the right cone is above the left. Rudder to starboard, ship turns to port, when the left cone is above the right. Hard aport, the ship moves to starboard, when the right cone is run up to the yard, and the left let down. Hard astarboard, the ship moves to the left, when the left cone is run up and the right let down.

The following were the stations of ships in foreign waters on October 21st:—

Taku.

Battle-ship—"Navarin."

First-class cruisers—"Admiral Nakhimov," "Dimitri Donskoi."

Gun-vessel—"Bobr."

Port Arthur.

First-class cruiser—"Admiral Kornilov."

Second-class cruiser—"Razboinik."

Gun-vessel—"Otvajny."

Vladivostok.

Battle-ships—"Sissoi Velikie," "Petropavlovsk."

Shanghai-Huan.

First-class cruiser—"Rossia."

Second-class cruiser—"Zabiaka."

Gun-vessels—"Mandchur," "Koriets," "Giliak."

Steamer—"Moskva."

Amoy.

First-class cruiser—"Rurik."

Woosung.

First-class cruiser—"Vladimir Monomakh."

Hankow.

Gun-vessel—"Gremiashchi."

Niuchwang.

Gun-vessel—"Sivuch."

Keeping open communications between Port Arthur and Taku.

Torpedo-cruisers—"Vsadnik," "Haidamak."

Cruising round Commendor Islands.

Transport—"Yakut."

MEDITERRANEAN.

Smyrna.

Battle-ship—"Imperator Alexander II."

Torpedo-cruiser—"Abrek."

Piræus.

Gun-vessel—"Kubanets."

Torpedo-boats—Nos. 119 and 120.

Algiers.

Gun-vessel—"Khrabry."

ATLANTIC.

Vigo.

First-class cruiser—"Herzog Edinburgski."

Brest.

Second-class cruiser—"Djigit."

Copenhagen.

Imperial yachts—"Poliarnaia Zvezda," "Tsarevna."

—*Kronstädtski Viéstnik.*

UNITED STATES.—*Naval Manœuvres at Newport.*—Extensive naval manœuvres were held at Newport, R.I., 24th and 25th September, in carrying out a programme arranged by the Naval War College, of which Captain C. H. Stockton, U.S.N., is president.

The vessels were skilfully handled, as were also the search-lights, both ashore and afloat, and an exceptional opportunity was given for the test of the various equipment, guns, etc. The only accident during the manœuvres to a vessel occurred to the torpedo-boat "Stiletto," which, in the glare of a search-light, ran into a wharf at Fort Adams, damaged her bow, and threw Lieutenant Lincoln overboard. He was promptly picked up. Two of the crew of the vessel sustained slight injuries.

The principal weakness in the naval problem of attack is believed to have been the assumption that the attacking fleet was familiar with the supposed existing mine-field and could pass. The manœuvres, it seems, have developed a weakness of the land fortifications in the matter of search-lights. The more powerful search-lights of the Navy, when turned upon the weaker instruments of this character on land, make the latter entirely useless with perfect freedom from harm. It is also pointed out that Admiral Sampson's experience at Santiago demonstrated our Navy's weakness when it comes to dealing with mines.

The general idea of the manœuvres was as follows :—

General Idea.—A very superior Red fleet is blockading a Blue force in Narragansett Bay. Information is received by the Blue commander-in-chief that it is the intention of Red to force the channel with his fleet during darkness, and attack Blue inside. After that date vigilant look-out is kept by the Blue, and every preparation is made to resist the attack of Red's superior force. West passage, Dutch Channel, is closed to all except torpedo-boats.

Special Idea (First Phase).—The commander-in-chief of the blockading fleet, knowing approximately the cleared opening on the mine fields of the main channel, forces the entrance with all the ships and torpedo flotilla, and advances to attack the Blue fleet inside. This advance is opposed by the full strength of inside forces, afloat and ashore.

Special Idea (Second Phase).—The Blue commander-in-chief orders a night attack by the torpedo flotilla upon the blockading fleet outside, which is executed within a week, the special occasion being decided upon by the commanding officer of the flotilla and approved by the commander-in-chief. Information as to the date and hour of attack is sent to the commanding officer of fixed defences.

The blockading fleet, which will represent twice or thrice the strength of the home fleet, and under command of the senior officer, will consist of the "Kentucky," the "Indiana," the "Texas," the "Scorpion," and either the "Leyden" or the "Eagle." The defence fleet, under Rear-Admiral Farquhar, will consist of the "New York," the "Massachusetts," the "Kearsarge," the "Vicksburg," and, possibly, the "Leyden." The torpedo flotilla, consisting of the "Holland" and six other ships, will be under the direction of the commander of the torpedo station.

Upon signal from the commander-in-chief on 22nd September, the Red fleet, equipped and provisioned for a week, will get under way and take station off the entrance to Narragansett Bay. They will be disposed for a close blockade of the port, and for successfully repelling any attack by the torpedo-boat flotilla, which is known to be inside, the ships must remain at least $5\frac{1}{2}$ miles from the two forts.

The commanding officers of the fleets will be notified of all disposition made by the Blue commander-in-chief. The hostile fleet's dispositions will be unknown to either, except such information as may be obtained from look-out stations, picket and scout vessels.

Prompt means of communication between the forts and ships being of the first importance, a system is suggested, to be known to Blue alone, and to be made familiar to the officers of both forts and ships, and to their signal corps. Wireless telegraphy and carrier pigeons will be employed. A look-out station will be established at Beaver Tail and supplied with signal kit, or the "Leyden" will be detailed as look-out and picket-vessel.

The plan of attack of the torpedo-boat flotilla will be known only to Blue, and Red's defence against it will be worked out by the officer commanding the hostile force, and be unknown to Blue, although information regarding Red's general system of blockade and methods of defence should be learned from the forts' signal and look-out stations.

During the fight blank charges of black powder from small guns will be fired from both ships and forts at proper intervals to simulate the firing of the heavy guns. In the manoeuvres of firing in the main channel and passing the forts the commanding officers will note the position of the ships every three minutes.

They are expected to determine the efficiency of the equipment of the guns and the rapidity of fire, whether or not it is possible to point the guns accurately at night and in front of the shore search-lights, and the efficiency of the system, for the control and use of the search-lights aboard ship under such circumstances.

Time of opening fire from either forts or ships will be indicated by a blank charge of black powder, fired in the direction of the target. Umpires will note the time of firing and the target fired at.

Effective torpedo range is 500 yards. A boat firing a torpedo within this range, indicated by shooting a red star, scores a hit. When a ship discovers a torpedo-boat she will fire a green star toward that boat. Whenever a green star is fired by a ship a blank charge of black powder from a rapid-fire gun on that ship will immediately follow. No other charges will be fired, but exercise of aiming and firing rapid-fire guns be carried on as in real action.

On board each vessel were one or two umpires, who will decide when the ship has been put out of action and other questions that may arise.

The Board of Arbitrament, consisting of Captain French E. Chadwick, Captain A. S. Snow, Colonel H. C. Hasbrouck, Captain Charles H. Stockton, and Commander Newton E. Mason, Lieutenant John M. Ellicott, recorder, heard the umpires and rendered the decisions. It decided that the hostile fleet ran the forts successfully Monday evening, 24th September, and decided that the "Stiletto" torpedoed the battle-ship "Massachusetts" Monday evening.

The sum of the decisions upon Tuesday evening's attack upon the Red fleet by the torpedo flotilla is that the torpedo-boats were defeated, and that all were sunk save the "Gwin," which the board decided put out of action both the "Scorpion" and the "Eagle." The "Gwin" joined the "Rodgers" and the "Morris" in a concerted attack upon the "Kearsarge," but the Board ruled that this attempt was a failure and that the "Kearsarge" put the trio of assailants out of action one after the other.

The Board disallowed the "Leyden's" claim of having rammed the "Kearsarge" in Monday night's affray, as the "Kearsarge" was supposed to have passed out of the field of action and was going to an anchorage.

The Board declined to allow the "Dahlgren's" claim that she had torpedoed the "Kearsarge," as the "Indiana" had put her out of action long before she got anywhere near the "Kearsarge." The committee say in their decision:—"The attack of the 'Dahlgren' on the 'Kearsarge' was successful, but it is inadmissible, as the 'Dahlgren' had already been put out."

The Board also decided against the claims of Lieutenant Caldwell, who piloted the submarine boat "Holland" out to sea in the hopes of destroying the flag-ship "Kearsarge." The "Holland" got in under the big ship and claimed a torpedo. The Board said in its decision in regard to the "Holland":—"When the 'Kearsarge' was adjudged out of action by the 'Dahlgren' she put on her lights and stood in toward the entrance and considered herself out. While doing this she was attacked and torpedoed by the 'Holland.' The Board disallows this, as the 'Kearsarge' was showing all her lights and not looking out for anything else.

In his report Admiral Farquhar, Commander-in-Chief, United States naval force, North Atlantic Station, dated 1st October, 1900, says:—

"The departure of the 'Kentucky' on the eve of commencing operations necessitated a change, Captain Folger with the 'Kearsarge' taking the place of Captain Chester and the 'Kentucky.' Lieut.-Commander F. F. Fletcher, commanding the 'Eagle,' expressed a desire to participate in the exercises, and was directed to take the place of the 'Bancroft.'

"At 2.0 p.m., Monday, 24th September, the Red squadron, consisting of the 'Kearsarge,' 'Indiana,' 'Texas,' 'Scorpion,' and 'Eagle,' accompanied by six torpedo-boats, put to sea to establish a blockade of Newport. The remaining vessels, the 'New York,' 'Massachusetts,' 'Leyden' and 'Vicksburg,' the last two simulating battle-ships, were disposed for the defence of the harbour, and arrangements were made for communication between the various forces afloat and ashore to insure active and satisfactory co-operation in defending Newport against the attack of the blockading force.

"The general plan followed by the Blue (inside) squadron was to place a battle-ship on each side of, and just inside, the mouth of the harbour, concealed from incoming vessels, with steam up, battery trained forward, and everything ready to fire into and ram any vessel succeeding in passing the forts. One battle-ship, the 'Vicksburg,' was placed just to the southward of Gould Island. Picket-boats, armed with rapid-fire guns and sharpshooters, were placed on both sides of her 400 yards apart. All picket-boats were provided with a system of signals to warn all hands of the approach of the enemy. The 'New York' was placed well inside, commanding the full length of the main channel, and in a position to go to any part of the field. Picket-boats were placed on each side of the eastern passage, out of the rays of the search-lights, prepared to destroy or cripple torpedo-boats and to report their approach. A look-out signal-station was also placed at Beaver Tail Lighthouse. The eastern passage was kept lighted by search-lights from the Torpedo Station, Fort Adams, and Fort Wetherell. The western passage was lighted by a powerful search-light at Fort Greble.

"The ships were cleared for action, batteries prepared and manned, and every condition of battle simulated as nearly as possible, though firing only blank charges from small rapid-fire guns.

"While so much was wanting, both in time and material, to carry out manœuvres on a large scale, there was no lack of zeal and enthusiasm among the men and officers engaged, and a number of very important professional points were brought out that will no doubt be of great value in the future.

"The Army officers were particularly impressed with the value of search-lights and they had an opportunity of seeing something of their effect when used on board vessels passing forts. The general plan followed by all vessels was not to turn on search-lights until the approach of a torpedo-boat was reported by a picket-boat.

"The plan of placing picket-boats was very successful; not a single torpedo-boat got by them without being reported. With a sufficient number of search-lights on shore, it is doubtful if vessels could be piloted into a harbour at night that was at all difficult of entrance.

"The bow wave and wake of torpedo-boats was the first object that aided in picking them up in the darkness. In this connection I would suggest the advisability of the Department's keeping as many torpedo-boats or destroyers as practicable with the squadron at all times to accustom both officers and men with their general characteristics, movements, etc., and in order to carry on exercises with them in all the various ports visited.

"The 'Holland,' unfortunately, in her attack upon the 'Kearsarge' the second night, did not reach there until after several torpedo-boats did.

"The second night's operations consisted in an attack upon the outside, or Red squadron by five torpedo-boats and the 'Holland.' As a rule, the torpedo-boats were successful, although this would scarcely have been the case with an efficient picket-boat service."

Captain Folger in his report says:—"The 'Holland' type will play a very serious part in future naval warfare."

Echoes from the Newport Manœuvres.—The recent manœuvres in Narragansett Bay accomplished so useful a purpose, that we hope to see them repeated under conditions more nearly approaching those that will be encountered by a naval attack upon a thoroughly fortified and defended harbour. Under such circumstances the influence of submarine mines cannot be ignored, as they were in this instance, and we may be treated to some interesting experiences in mining and countermining, concerning which our knowledge is still imperfect, especially as concerns countermining. Our forts should be provided with more efficient search-lights, or more of them, and some means should be found for determining what part will be played in a naval attack by the mortar batteries with which our principal forts are provided. As it was, the experiences in Narragansett Bay have thrown only side lights upon the problem of the relative efficiency of fixed and floating instrumentalities of war when they are arrayed against each other in battle. In this instance it is noted by an "Expert" who writes in the *New York Sun*:—

"First—That the Naval Board assumed a channel cleared of mines. We, however, know of no instance in history of successful countermining against modern mines on the part of a fleet. In the Spanish war our commanders did not run the risk of losing a war-ship in attempting to force the mined harbours either at San Juan or at Santiago. It may be safely assumed that there is no sure way of countermining against a modern mine field well backed by the fire of modern forts; and the point having been evaded in the programme, the manœuvres must therefore be looked upon as a simulated war-game rather than an attempt to force a harbour under actual service conditions.

"Second—The value of the search-lights was conclusively shown by the manœuvres. It was only by means of the limited number of search-lights they possessed that the forts were enabled to accomplish such excellent results. The fleet was thoroughly equipped with search-lights, and at times was temporarily

successful in overpowering the search-lights of the forts. We assume that this will not be possible when the full complement of search-lights has been provided for the forts.

"Third—It has been suggested that the line of defence at Narragansett Bay is too far withdrawn; that it should be brought forward about three miles and placed at the headlands. It is true that this would enable the forts to commence fire earlier on the fleet; but, on the other hand, it would be practically impossible to establish an effective mine field on the outer line. In view of the further fact that the cities and the main waters to be defended are so far withdrawn from the ocean at Narragansett Bay, it seems to us wise that the forts have been built sufficiently far back from the headlands to permit them to concentrate their fire upon the ships, one at a time, as the latter advance in column up the narrow channel. In fact, the facility with which this was done in the manœuvres shows the wisdom of the selection of the interior line for the main line of defence.

"Fourth—Help from the friendly fleet. The manœuvres of the second night when the torpedo-boats attacked a blockading fleet with such success, show conclusively that they will appear at infinitely greater advantage in the defence than in the attack. On the first night the battle-ships of the friendly fleet were stationed so far behind the main line of defence as to be of little assistance. Drawn up as they were they simply invited the torpedo attack. Had they been brought up closer to the mine field their fire would have assisted the forts. The conclusion to be drawn is that torpedo-boats may be of great value to the defence in breaking up a blockade by a hostile fleet, but that war-ships are needlessly expensive for purposes of coast defence, unless the channel is too wide to be defended by forts alone."—*Army and Navy Journal*.

MILITARY NOTES.

PRINCIPAL APPOINTMENTS AND PROMOTIONS FOR OCTOBER, 1900.

Brevet Colonel F. F. Johnson, from Lieut.-Colonel h.p. to be an A.A.G. and to have the substantive rank of Colonel in the Army. Major and Brevet Lieut.-Colonel H. C. O. Plumer, the York and Lancaster Regiment, to be a Brigadier-General on the Staff in South Africa, and to have the local rank of Brigadier-General whilst so employed. Colonel W. F. Stevenson, M.B., R.A.M.C., P.M.O. at Army Head Quarters, to be graded as a Surgeon-General, and to have the local rank of Surgeon-General whilst so employed. Major-General Sir M. G. Gerard, K.C.S.I., C.B., I.S.C., to be Lieut.-General. Colonel J. Cook, C.B., I.S.C., to be Major-General. Lieut.-Colonel R. B. McComb, A.S.C., to be Colonel. The under-mentioned officers are granted the local rank of Major-General whilst employed on the Staff in China:—Colonel (local Brigadier-General) L. R. H. D. Campbell, I.S.C.; Colonel Sir N. R. Stewart, Bt., I.S.C.; Colonel A. J. F. Reid, C.B., I.S.C.; Lieut.-Colonel and Brevet Colonel G. L. R. Richardson, C.B., C.I.E., I.S.C.; Colonel (local Brigadier-General) A. R. F. Dorward, C.B., D.S.O.; Colonel J. T. Cummins, D.S.O., I.S.C. Major-General Sir H. E. Colville, K.C.M.G., C.B., resumes command of the Infantry Brigade at Gibraltar as a Major-General on the Staff. Lieut.-Colonel and Brevet Colonel H. Barron to be a Colonel on the Staff for Royal Artillery, and to have the substantive rank of Colonel in the Army. Lieut.-Colonel R. Thompson, R.E., to be Colonel. Lieut.-Colonel E. J. T. Ross of Bladensburg, R.E., to be Colonel. Lieut.-Colonel S. McM. Maycock, R.E., to be Colonel. Major-General and Hon. Lieut.-General J. W. Laurie to be Colonel of the Royal Munster Fusiliers. Lieut.-Colonel W. A. Yule from h.p. to be Colonel to command the 21st Regimental District (the Royal Scots Fusiliers). Lieut.-Colonel E. J. Dewing, R.E., to be Colonel. Lieut.-General (local General) Sir G. S. White, G.C.B., G.C.S.I., G.C.V.O., V.C., Colonel the Gordon Highlanders, Governor and Commander-in-Chief, Gibraltar, to be General. Major-General (temporary Lieut.-General) Sir W. F. Butler, K.C.B., Commanding the troops, Aldershot (temporary), to be Lieut.-General. Brevet Colonel St. G. C. Gore, Surveyor-General of India, from Lieut.-Colonel R.E., is granted the substantive rank of Colonel in the Army. Field-Marshal the Right Honourable F. S., Lord Roberts, K.P., G.C.B., G.C.S.I., G.C.I.E., V.C., Commanding-in-Chief the Forces in South Africa, from Colonel Commandant Royal Artillery, to be Colonel of the Irish Guards. Lieut.-General Sir R. C. Low, G.C.B., Bengal Cavalry, to be General. Major-General R. M. Jennings, C.B., Bengal Cavalry, to be Lieut.-General. Lieut.-Colonel G. F. Browne, D.S.O., Military Attaché, Peking, to be Colonel. Lieut.-Colonel H. W. Brackenbury, R.F.A., to be Colonel. Lieut.-Colonel N. P. O'Gorman, D.A.A.G., China and Hong-Kong, to be Colonel. Major-General F. R. Solly-Flood, to be Colonel of the Prince of Wales's Volunteers (South Lancashire Regiment). Lieut.-Colonel N. M. Lake, R.E., to be Colonel. Supernumerary Major-General (local Lieut.-General) J. D. P. French, Commanding Cavalry Division, South Africa, to be Major-General. Lieut.-Colonel and Brevet Colonel T. E. Stephens, on the Essex Regiment, to be a Major-General on the Staff (instead of a Brigadier-General on the Staff) to command an Infantry Brigade in South Africa, and to have the local rank of Major-General whilst so employed. Lieut.-Colonel G. L. Garstin, I.S.C., to be Colonel. General F. A., Lord Chelmsford, G.C.B., from the Sherwood Foresters, to be Colonel of the 2nd Life Guards.

AUSTRIA-HUNGARY.—An Imperial decree of the 4th September last orders the formation of a Military Medical School at Vienna on the 1st of the following October. The object of this institution is to perfect military medical candidates in the branches of instruction which were taught them at the university, and to give them that theoretical and practical instruction so necessary to the performance of their duties both in peace and in war. As far as the exigencies of the Service will allow, the chief and the most junior regimental doctors may be authorised to follow the course, the period of which is fixed at one year. The school is commanded by a senior doctor of the first class, with the rank of Colonel.

The programme of instruction consists of:—First, a theoretical portion bearing on military hygiene and pharmacopœia, surgery in war, psychopathology, the military sanitary service in peace and war, army organisation, tactics, topography, map reading, and army administration. Second, a practical portion embracing surgical operations, diagnostics, bacteriology, and the visiting of the large establishments in Vienna and the neighbourhood, from a hygienic point of view.

An examination at the termination of the course takes place at the end of July before a Board consisting of the principal medical officer, the commandant and the professors of the school. A classification list, accompanied by a report on the whole course, is forwarded to the Minister of War.

During the months of August and September the military medical candidates assist in visiting the sick at the Vienna hospital.—*Bulletin de la Presse et de la Bibliographie Militaires.*

FRANCE.—Young men who intend taking up the medical profession, and who, as such, are excused two years' service, must first put in a period of military instruction, varying from three to four months, in regiments, during which they are instructed in various regimental drills and routine. They are then sent to infirmaries and practise medicine under the superintendence of the corps doctors. In order to guard against the present dearth of military doctors, who are only 1,250 in number instead of 1,400, the Minister of War intends, so the *Temps* says, to put in force a motion brought forward during the last session by Dr. Lachand, in accordance with which medical students will be at once sent to infirmaries or to military hospitals. They will there be initiated into the various military medical regulations, and prepared for their future medical duties either in the Reserve or Regular Army. These students will not be required to perform the drills required from other conscripts.

The *France Militaire* states that special attention has recently been paid in France to the use of carrier pigeons by the cavalry. The bird is carried in a basket attached to the rider's shoulders in the same way as a knapsack. At first the basket was attached to the saddle, but the jolting soon rendered the bird incapable of performing any useful service. It was placed in a zinc tube with its feet drawn up and its wings folded, but the jolting removed all the feathers from the back of the bird and left the flesh bare and sore. The bird is still placed in a tube, but the tube is made of wicker and lined with hair, the elasticity of which deadens the effect of the jolting. One, two, or three such tubes can be carried in the basket. The birds are in a numbed condition when first taken out of the tubes, but they speedily recover unless they are left several days in the tubes, when the numbness ends in death. To prevent this, a light form of folding cage is carried, in which the birds can rest and recover themselves during a halt and partake of nourishment. Twelve men belonging to the cavalry are sent every year to attend a course of instruction in the handling and treatment of pigeons at the military pigeon station at Vaugirard.

The *Siècle* announces that the date of the despatch to Algeria of the first of a series of reinforcements is fixed for 19th October. They will consist of 15 officers

and 400 men of the 92nd Infantry. On 26th October 400 men of the 121st Infantry will start, to be followed by the same number of men from the 14th and the 108th Regiments, forming part of the 12th Army Corps. It is said that men will also be sent from the 13th, 15th, and 16th Army Corps. Some troops will embark on the ships of the *Compagnie Transatlantique*. The situation at Tuat renders the sending of other reinforcements necessary. Large quantities of provisions will be sent from the commissariat of the 15th Army Corps, and a number of heavy guns with men and ammunition are being put on board the cruisers at Toulon.

According to the *Patrie* the commandants of the French recruiting offices have received a circular relative to the incorporation of 74,980 conscripts, who will be called up next month for one year's service. They will be distributed as follows:—Infantry, 60,175; artillery, 10,303; engineers, 1,223; army service corps, 1,221; clerks and workers in the administration, 969; and hospital attendants, 10,303. The young recruits will be sent as much as possible to garrisons near to their homes. The calling up of the three-year recruits will take place later.

The French Minister of War has addressed an instruction to the commanders of the army corps, to the prefects and sub-prefects, and to the commanders in charge of the recruiting relative to a census of horses and mules which will be available for use in 1901. This is in accordance with the law of 3rd July, 1877, and in virtue of this law the mayors will have to publish at the beginning of December a notice addressed to all proprietors prescribing that they shall present themselves at the office of the mayor of their district before 1st January next and make a declaration as to all the horses and mules they have in their possession without any exception whatsoever, and state their respective ages and give a description of them.

The *Patrie* states that the commanders of the army corps at the French manoeuvres are unanimous in their reports as to the utility of the automobiles. It so happened that among the men called up for the 13 or 28 days were some of the most experienced drivers, so that the officers using the automobiles were exceptionally well served. The advantages mentioned in the reports are that they permit the commander of the army to go rapidly from one point to another of his line of battle and let the full influence of his presence be felt. They permit him also to pass through the camps of the various army corps and divisions daily and keep in touch with their commanders. Their motor tricycles are useful to send individual staff officers to the headquarters of the generalissimo. On the other hand, all attempts to use the automobiles for the purpose of reconnaissance of the enemy's positions failed at the manoeuvres. They would fail still more certainly in real warfare, as a shot fired into the delicate mechanism of the machine would stop it dead. It is suggested that automobiles should not only be available at the headquarters of armies and army corps, but also at those of divisions.—*Times*.

The very rapid progress made in automobilism within the last year or two, says *L'Illustration*, has so far increased the efficiency of the automobile as a safe and sure means of rapid transportation that the French Army officers, in the recent manoeuvres, determined to ascertain to what extent motor-carriages could be used in war. The vehicles used can be divided into three classes:—1. Automobiles for the transportation of the *personnel*. 2. Automobiles for the transportation of special *matériel*. 3. Traction-engines for the transportation of heavy guns and stores.

The vehicles of the first class are more or less similar to those in general use. De Dion-Bouton tricycles were employed by the staff officers for the rapid transmission of orders and despatches. The machines were painted the regulation

grey, the colour which has been adopted for the artillery for the reason that of all hues it is least visible at great distances. Written commands were carried in a bag suspended from the handle-bar. More than twenty tricycles of the De Dion-Bouton type were employed by the several staffs under the command of General Brugère.

A Decauville voiturette with a carrying capacity of three has been specially designed for the rapid transportation of staff officers. Several voiturettes of this type were also employed during the manœuvres.



MAIL WAGON.

Three years ago Panhard and Levassor, the well-known automobile manufacturers, were commissioned to build an eight-seat omnibus of 12-H.P., capable of travelling at a speed of 22 miles an hour. Each of the two armies at this year's manœuvres was furnished with one of these vehicles.



TELEGRAPH SUPPLY WAGON.

A high-speed automobile for staff use was built in 1896 by the Société d'Electricité et d'Automobiles Mors. This machine was used on several occasions, notably during the manœuvres of 1898. The vehicle has a speed of 36 miles an hour and a carrying capacity of four. In the last manœuvres five automobiles of this pattern were employed.

For the commanding general of an army or of an army corps Peugeot has specially designed a very comfortable carriage of 12-H.P. and a speed of 18 miles an hour. The two front seats are occupied by the driver and an orderly. In the centre the general and the chief of his staff are seated; a closet, a desk, two

lamps, are furnished for their convenience. In the rear, room for two staff-officers is provided, as well as a small table, a lamp, and hooks for the swords. An opening enables the officers to communicate with the compartment of the commanding general. The baggage is placed on the top of the vehicle.



CARRIAGE OF THE COMMANDING GENERAL.

The second class, as we have already remarked, includes automobiles designed for the transportation of special *matériel*. In this class we find a surgeon's carriage of improved form. The forward part is reserved for the driver and two invalids. The partition which serves as a support for the wounded men



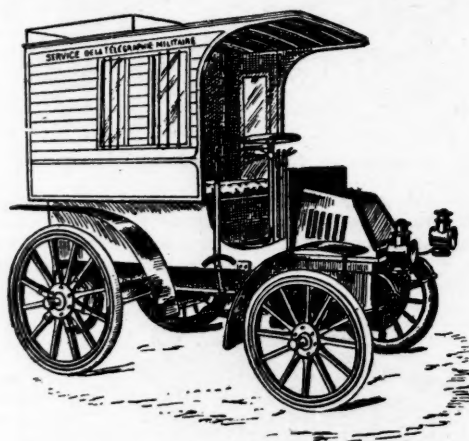
SURGEON'S WAGON AND AMBULANCE.

is movable, so that it can be pushed aside to expose a compartment containing an operating-table provided with the usual surgical appliances. The centre of the carriage is sectioned off into twelve compartments provided with sliding doors opening on the side of the vehicle. The twelve compartments contain baskets for medicines, bandages, and the like. Beneath the vehicle two large boxes are

carried for larger objects, surgical instruments, etc. In the rear is a small compartment with sufficient room for two surgeons, a table, lamp, hooks, etc. The seat-boxes each inclose a water reservoir of six gallons. Near the door of the rear compartment is a small closet which contains a steriliser supplying pure water. On the other side of the door a ladder is suspended, by which the top of the vehicle, where canteens, stretchers, etc., are kept, can be reached. Above the steriliser a tent is folded, which, when unrolled and secured by one edge to the carriage, serves as a hospital. This vehicle is driven by its 10-H.P. motor at speeds varying from 3 to 12 miles an hour. Solid rubber tyres are employed, for the reason that pneumatic tyres are too easily punctured and that great speeds are not necessary.

Georges Richard has built an army postal automobile with a speed of 18 miles an hour. The vehicle resembles previous models of this type.

One of the most interesting of the many appliances tested at the manoeuvres was the Renault voiturette search-light. The voiturette itself was an ordinary automobile driven by a 3-H.P. motor. In the rear of the carriage a dynamo,



AUTOMOBILE TELEGRAPH WAGON.

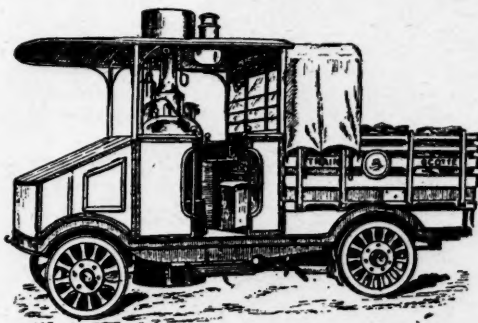
furnishing a current of 30 ampères at a pressure of 40 volts, was mounted. The armature was directly driven by the motor through the medium of a universal joint. The dynamo generates current for a search-light of the usual pattern, mounted upon an aluminium tripod. With the intense light thrown by this apparatus a newspaper can be read at a distance of 2 miles from the source of light. The telegraph supply wagon is exactly similar to that ordinarily employed in the Army. The maximum speed is 18 miles an hour.

The automobile telegraph office is one of the most ingenious contrivances used by the Army. Behind the front seat is a removable partition. When the carriage is stopped to communicate with the other end of the line, the partition is raised; the telegraph operators turn round, face the instrument table, and transmit their messages when their instruments have been connected with the line by two men who are especially carried along for the purpose.

The third class is composed primarily of traction-engines for the transportation of heavy artillery, regimental trains, bridge trains, field bakeries, etc. The traction-engines are of the well-known Scotte and De Dion-Bouton types. The Scotte engine is the most powerful machine of its kind. It recently climbed a 10

per cent. grade hauling siege guns weighing 55,000 lbs. Both the Scotte and De Dion engines are driven by steam. The rear portion of the Scotte engine is reserved for the storage of coal and is provided with two seats for the attendants. The rear compartment of the De Dion-Bouton vehicle can be employed for the transportation of goods. The fuel capacity is less than that of the Scotte engine; nevertheless, the vehicle can easily cover 42 miles with a single charge of coke.

Of all the automobiles employed by the French Army, these traction-engines gave the most promise of future success. Despite their cost, they are less expensive than the horses for which they are substituted. The repairs which must



SCOTTE TRACTION ENGINE.

inevitably be made by no means equal the loss of draught animals during a war. The coal or coke consumed as fuel can be obtained for one-quarter the cost of fodder, and occupies but one-twentieth of the space. In actual warfare it is a matter of no little difficulty to procure fodder; coal, on the other hand, is found almost everywhere. The train of an army corps is reduced from 14 to 6 miles in length if traction-engines alone are employed. The normal speed of a draught-animal is $2\frac{1}{2}$ to 4 miles, the maximum speed, 4 to 5 miles an hour; a day's journey rarely exceeds 16 miles. With traction-engines, on the contrary, the normal speed attainable is $4\frac{1}{2}$ to 5 miles; in an emergency, $7\frac{1}{2}$ to 11 miles can be covered in an hour. Since a machine never becomes tired, no limit can be set on the distances which can be traversed.—*Scientific American*.

GERMANY.—Germany was the first country to organise a system of military dovecots. After the autumn of 1871 the Minister of War caused the necessary enquiries to be instituted for the formation of a network of dovecots on the western frontier, and to ascertain the best methods for the recruiting, the rearing, and the training of carrier pigeons.

The question was rapidly solved. In 1874 military dovecots were established at Cologne, Metz, Strasbourg, and Berlin, each containing 100 pigeons of the Anvers breed, which is the favourite one in Germany. Since that time they have not ceased to further extend the German network, so as to make it the most complete in Europe. There exist, at the present time, stations in almost all the fortified towns, and in the large cities of the interior and the seaboard. The administration of all the military dovecots is centralised at Cologne. This place is in direct communication with Berlin, which is the central station, and with which all the coast stations are also in direct communication, and these latter communicate besides directly with one another. Cologne constitutes a connecting station for Metz and probably also for Mayence. Strasbourg and Metz are both in communication with Berlin by Würzburg.

The dovescots have, as a rule, a number of pigeons commensurate with their importance. This number, which is 200 for small stations, 600 for medium sized stations, is as much as 1,000 at Metz, Strasbourg, Cologne, and Thorn. In each dovescot a non-commissioned officer of Engineers and a competent pigeon-fancier are entrusted with the care and training of the birds. They are under the orders of the station commandant, who is responsible for the feeding and despatch of the pigeons. The Federated Society of German Pigeon-Fanciers possess 73,000 pigeons, which in the event of war would be placed at the disposal of the Government. Nothing is neglected to bring to the highest state of perfection the organisation of this method of communication, the importance of which is thoroughly appreciated.—*Journal des Sciences Militaires.*

Streams are most naturally and easily crossed by means of bridges. But it often happens in time of war that bridges have been destroyed, and that, for lack of time, pontoon military bridges cannot be constructed. For such cases Prussian tacticians have provided certain drills which must be mastered by all the troops.

The artillery is to transport its guns in time of war by means of rafts made of casks lashed together, upon which a platform is to be secured. These rafts are to be towed by boats manned by the gun crews; the horses are to be led by their bridle-reins, as our illustration shows.

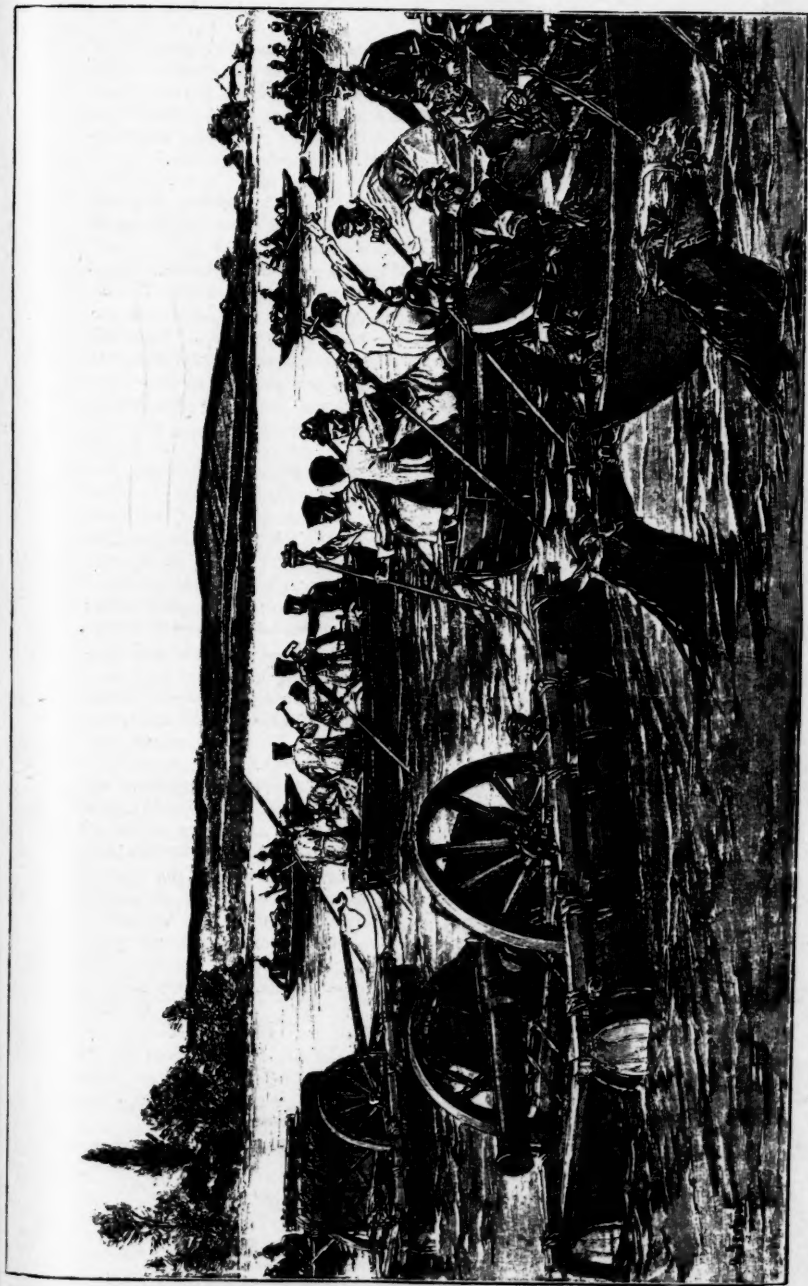
Like the artillery, the cavalry is also drilled in crossing rivers. The horses, carrying their riders whenever possible, are made to swim to the opposite shore; but, when hampered by much baggage, the men cross the river in boats, the horses being guided by their bridle-reins.

For the patrol service no river should be impassable. When means of transportation are not at hand, the horses must needs carry their riders through the water. For such emergency cases, there are in every squadron a number of troopers hampered by no baggage whatever, and so lightly clad that they can swim through the water while clinging to the manes or tails of their horses. In time of war the saddles of the horses are to be left behind; and the troopers are to remove their boots. If, during the course of a battle, the cavalymen are forced to take to the river by the enemy, they are to plunge in without any previous preparation, merely clinging to the manes or tails of their horses. If there be time enough, the baggage is to be carried across the river by boats in the manner previously described.

In time of peace the cavalymen are drilled in swimming by a specially appointed officer who is personally responsible for the safety of the men under his care.

The second trial of Count Zeppelin's colossal air-ship is described in press reports from Friedrichshafen as being a notable success. After rising to a height of about 2,000 feet the vessel remained poised at that level for three quarters of an hour. It then made a series of tacks, and went through certain turning manœuvres, and afterward travelling with the wind in what is described as "a generally circular direction" for about 6 miles, the velocity of the wind at this time being about 8 miles an hour. It is said that later, in a freshening breeze, the air-ship turned and "made headway" against the wind. Eventually the vessels descended with "great ease and steadiness to the lake" and was towed to its shelter. The stability and steering powers of the air-ship are described as being excellent.

If the above reports are correct, we still know as little about the actual practical value of Count Zeppelin's machine as we did before. It has been proved merely that an air-ship of this kind can ascend, maintain its equilibrium, and be navigated in any desired direction, provided the wind does not much exceed the strength of a gentle breeze. It has yet to be shown that in stronger winds, say



THE TRANSPORTATION OF GUNS ACROSS A RIVER BY THE GERMAN ARTILLERY.

from 20 to 50 miles an hour, this air-ship can perform the same evolutions. If it should show that it is able to maintain a speed of, say, only 20 miles an hour against a strong wind, aerial navigation by the balloon type of air-ship will have made an enormous stride in these closing days of the century. Enough has been accomplished to render the further trials of Count Zeppelin's costly and carefully thought-out design a matter of wide-world interest.—*Scientific American*.

The *Vedette* states that a new regulation has been introduced into the Bavarian Military Academy with reference to the French and Russian languages. Before 1st October this year the learning of Russian was entirely optional, and all the pupils continued to learn French throughout the three courses. From 1st October all pupils who are found to have a satisfactory knowledge of French at the end of their first course will be compelled to learn Russian during the second and third courses, when they will receive four lessons weekly. They will be expected also to attend French conversational classes twice weekly. Pupils who are not learning Russian will continue to take four lessons in French weekly during the three courses. It is expected that the new regulation will extend very considerably the knowledge of Russian in the Bavarian Army.

That most modern weapon, the automatic machine gun, says the *Vedette*, has already been adopted by several Powers, who have recently recognised its value in certain kinds of fighting. Thus the German Army has provided ten Jäger battalions and two infantry regiments with them. During the Imperial Manœuvres opportunities were found for making new experiments with them. On several occasions the opposing sides used groups of automatic machine guns, either as an auxiliary arm, to reinforce infantry and cavalry, or to protect the flanks when attacking woods strongly held by infantry, or for the defence of all sorts of defiles.

The automatic machine gun rests on springs, and is fixed on a wheeled gun-carriage, which, with the limber, makes a four-wheeled equipage, drawn by four horses driven by artillery drivers. The gun itself is surrounded by a bronze casing, the space between the casing and the gun being filled with water to prevent overheating from the great number of cartridges fired. The gun-carriage, with an armoured gun case, is furnished with steel shields to protect the gun detachment and the gun itself, and has the necessary apparatus to give a lateral and horizontal direction to the piece. The gun detachment consists of a mounted master gunner and four men, who, on the march, ride two on the gun-carriage and two on the limber. The service of the gun, which is constructed so as to utilise the recoil, is extremely simple. About 250 cartridges are fixed on to a webbing, which is unrolled so rapidly during the firing, by the breech mechanism, that it may be entirely used up in 30 seconds, so that about 500 or 600 shots may be fired in one minute. According to specialists the automatic machine gun has given excellent results in the cases mentioned above, and the Imperial Manœuvres of this year will probably put an end to any further experiments. The final adoption of this weapon cannot be much longer delayed.

ITALY.—The Minister of War has just published his annual report on the recruiting operations and the details of the Italian Army from the 1st July, 1898, to the 30th June, 1899. The following information, taken from this voluminous publication, should be of interest to military readers.

On the 30th June, 1899, the total effective strength of the Italian Army amounted to 3,236,161 men, thus distributed :—

PERMANENT ARMY.					
With the colours	...	...	...	...	254,087 men.
On unlimited furlough...	...	...	...	...	571,254 „
Total	...	...	...	...	825,341 „

MILITIA.

Mobile Militia	304,587 men
Territorial Militia	2,106,233 „
Grand Total	3,236,161 „

If these numbers are compared with those fixed on the 30th June, 1898, (3,221,726 men, of whom 318,012 were with the colours and 2,903,714 were on leave) it will be seen that the total effective on the 30th June, 1899, is increased by 14,435 men. This augmentation is accounted for by an increase of 78,360 men on furlough (both Mobile and Territorial Militia being accounted as on leave), compensated for by a decrease of 63,925 men with the colours.

This important diminution in the number of men actually serving is thus accounted for :—On the 30th June, 1898, there were still men of the 1st Class of 1870, 1871, 1873, and 1874, serving with the colours, as well as railway *employés* and artificers of all the different classes that the Government had been compelled to call to the colours on account of the insurrections which took place in various parts of the peninsula, and especially in Milan, in 1898.

On the other hand, the increase in the number of men on leave, shown on the 30th June, 1899, is caused, firstly, because all the men mentioned above were sent to their homes when no longer required ; and, secondly, because the 1878 Class, which has taken the place of the 1859 Class, struck off the rolls, is more numerous than the latter.

The 254,087 men belonging to the Permanent Army are made up as follows :—

Non-commissioned officers	15,165
Corporals	44,013
Men	194,909
Total	254,087

On the same date (30th June, 1899) the effective of the officers of the Permanent Army belonging to the combatant branches was as follows :—

Ranks.	General Staff.	Staff Corps.	Cara- biniers.	Infantry.	Cavalry.	Artillery.	Engin'rs.	Total.
Lieutenant-Generals	52	—	—	—	—	—	—	52
Major-Generals	84	—	—	—	—	—	—	84
Colonels	5	27	7	118	21	53	22	250
Lieutenant-Colonels	—	37	17	235	34	69	30	422
Majors	—	24	32	401	57	124	72	711
Captains	—	41	134	2,184	848	559	151	3,317
Lieutenants	—	—	284	3,403	413	704	280	5,084
Sub-Lieutenants	—	—	97	711	114	143	46	1,111
Bandmasters	—	—	1	95	—	—	—	96
Grand total ... ..	...	...	...	...	...	...	...	11,127

The number of officers belonging to other branches of the Service amounts to 2,516, consequently the total effective of officers of the Permanent Army is 13,643.

Altogether, Italy has 35,909 officers for her 3,236,161 men. These officers are thus distributed :—

PERMANENT ARMY.

On the Active List	13,643
Unemployed	275

MILITIA.					
Mobile Militia	...	...	...	...	5
Territorial Militia	...	...	...	...	4,233
Supernumerary Officers	...	...	...	...	10,557
On special duty	...	...	...	...	942
Reserve Officers	...	...	...	...	6,254
Total	...	...	...	...	35,909

It should be observed that these large numbers only exist on paper, for the Territorial Militia, which ostensibly consists of over two million men, includes one million at least who have little or no military training, and who would consequently be of no service in the event of mobilisation.

The roll of officers of the Reserve, on the other hand, only consists, for the most part, of old and worn-out officers quite incapable of the fatigues of a campaign. It must, nevertheless, be admitted that Italy can dispose of two million men and about 30,000 officers who are immediately available. This same report also contains several details about the 1878 class, of which the following is a *résumé* :—

On the day of the commencement of the recruiting operations the number of young men inscribed on the lists amounted to 414,001, thus divided, viz., 315,948 born in 1878, and the remaining 98,053 belonging to older classes. The verification of the list reduced this number by 10,367, and consequently 403,634 men remained on the recruiting lists.

During the preliminary operations 2,523 recruits of former classes, who had failed previously to appear, presented themselves voluntarily in order to satisfy the law; on the other hand, there were 13,140 struck off for various causes (12,130 deceased, 459 men inscribed twice, etc.). Altogether 393,017 men took part in the final recruiting operations. The result was as follows :—

ENROLLED.					
1st Category	...	...	...	...	106,943
2nd Category	...	...	...	...	233
3rd Category	...	...	...	...	97,399
Total	...	...	...	...	204,575 or 52·5 per cent.
Postponed	...	...	...	...	88,987 or 22·4 „
Unfit	...	...	...	...	72,495 or 19·2 „
Failing to appear	...	...	...	...	26,960 or 5·9 „
Total	...	...	...	...	393,017 = 100 „

What is most striking in these numbers is the small number of men posted to the Permanent Army (106,943), which represents 27·28 per cent. of the numbers inscribed. It must, however, be observed that the number of dispensations from service in the Italian Army are very numerous. On the other hand, the number of those failing to appear (26,960) is worthy of attention. This situation is the normal one, the number of those failing to appear being each year about the same.

This state of things is, to a great extent, accounted for by the large number of emigrants who refuse to return to Italy to undergo their military obligations. This is one of the evils in the Italian Army. In peace-time the Army does not suffer much from it, because the Budget only allows for the enrolment of a limited number of soldiers, but in the event of a mobilisation the Italian Army would greatly feel the absence of these individuals, who are, for the most part, sturdy and enterprising.

The 106,943 men placed in the 1st Category, that is to say posted to the Permanent Army, are thus distributed :—

Men of the 1878 Class	80,644
Postponed from the 1876 and 1877 Classes... ..	22,462
With the Colours (N.C.O.'s, voluntary enlistments, etc.)...	3,837

Total 106,943

The following are the terms of service for which these men are liable :—

For 3 years	53,471
For 2 years	45,217
For 1 year	8,255

Total 106,943

Thus only 50 per cent. of the men posted to the Permanent Army put in 3 years with the colours. At the time of enrolment, which is carried out twice (in November for the mounted and in March for the other branches of the Service), the numbers were reduced to 99,129 men, who are thus distributed :—

Infantry	71,725
Cavalry	7,602
Artillery	11,076
Engineers	3,120
Transport	1,795
Medical Service	1,000
Commissariat	789
Carabinieri	1,579
Cadet Officers and Cadet Sergeants...	443

Total 99,129

—*La France Militaire.*

If the way the population is distributed in the different districts in Italy is considered, one remarks that this distribution is as follows :—

Northern Italy	44·5 per cent.
Central „	18·5 „
Southern „	25·5 „
Insular „	12·5 „

Consequently, if the Italian Army in the various garrisons were divided proportionately to the population, which would appear logical, each great district would contain the following troops :—

Northern Italy	10½ divisions (42 infantry regiments).
Central „	4½ „ (18 „ „).
Southern „	6 „ (24 „ „).
Insular „	3 „ (12 „ „).

The actual distribution of the troops, as regards infantry, differs slightly from the theoretical one, and is as follows :—

Northern Italy contains	11 divisions (44 regiments).
Central „ „	5½ „ (22 „ „).
Southern „ „	5 „ (20 „ „).
Insular „ „	2½ „ (10 „ „).

It will thus be seen that the Southern districts and the islands have been depleted to increase the troops in Northern Italy (where the frontier lies, that they consider threatened), as well as those in Central Italy, where their young capital is situated.

As regards cavalry and artillery, the disproportion that exists between the theoretical and the actual distribution of the troops is more marked. The Italians keep round their capital that proportional part of the cavalry and artillery which come from Central Italy, but they have sensibly denuded the Southern and Insular districts in order to concentrate the greater portion of their cavalry and artillery in Northern Italy, which at present contains 29 regiments of these two branches

of the Service, whereas their theoretical share is only 21. There are, no doubt, excellent strategic reasons for such a distribution of their troops, but, in spite of that, some provinces complain that they are neglected, and plead for a more equitable distribution of the garrisons.—*La France Militaire*.

The *Italia Militare e Marina* states in reference to the transformation of the field guns in the Italian Army that two-thirds of the guns are 3·5-inch (90-millimetre), and one-third 2·7-inch (70-millimetre). The 3·5-inch guns are of much more recent manufacture than the 2·7-inch, and will repay conversion into Q.F. guns, as they are capable of performing good service for some years yet. The guns of this calibre already in possession of the regiments have all been converted. In the case of the 2·7-inch gun, the conversion will not take place, not only on account of its small calibre, but also and chiefly because it is too old to render it worth while. To take its place a new gun has been adopted of the same calibre, but superior not only to the old 2·7-inch gun, but also to the 3·5-inch gun. Its smaller calibre as compared with the latter is compensated by its greater mobility, the same number of horses (six) being employed to pull it. Its greater efficiency consists in its being more up to date in every way, while the conversion of the 3·5-inch merely affects the rate of firing and does not otherwise increase its power. Experiments are being made with a new 2·7-inch mountain gun, the one at present in use being quite out of date.

ROUMANIA.—The following are the regulations laid down, by a recent law, for officers of the Reserve :—

RECRUITING.

Officers of the Reserve are recruited from :—

1. Pensioned, resigned, or compulsorily retired officers.
2. Young men belonging to the following retired categories :—
 - a. Pupils from colleges, from special high schools, and from practical schools of agriculture, forestry, commerce, and the fine arts. These young men, according to the recruiting regulations, have only to serve one year in the Regular Army. Those who, having been promoted corporals, successfully undergo an examination for the rank of sergeant, are, at the expiration of their year's service, promoted to that rank, and called up for two months in the course of the following year, in order to carry out, as candidates for reserve officers, the duties of squad commanders. An officer's commission is conferred on them after satisfactorily passing an examination for fitness.
 - b. Pupils from the National School of Bridges and Roads. These obtain the rank of sergeant on leaving the above establishment, where a military curriculum is taught by officers nominated by the War Department. They must, in order to become sub-lieutenants of the Reserve, come up to the requirements of the course, and show the aptitude demanded of the young men of the preceding category *a*.
 - c. Non-commissioned officers are re-engaged who satisfy the prescribed tests.

PROMOTION.

In peace-time company officers of the Reserve may obtain promotion up to the rank of major inclusive, where they have completed four years' service in the rank of sub-lieutenant, four years in that of lieutenant, and ten years in that of captain. They must, in addition, satisfy the conditions of fitness required from officers of the Regular Army, and those who come under the categories *a*, *b*, and *c* must take part in it at least two periods of the autumn concentration in order to pass for the next higher rank. Superior officers of the Regular Army, who pass into the Reserve, can only advance one step in seniority,

and that only if they show their fitness for command at the autumn manoeuvres. In war-time the promotion of officers of the Reserve is carried out according to the regulations in force for officers of the Regular Army, and those who are mentioned in orders for gallantry may be transferred to the active list.

With regard to command, officers of the Regular Army take precedence of officers of the Reserve of the same rank, no matter what may be the seniority of the latter. Nevertheless, ex-officers of the active list retain the privileges attached to the seniority of the rank they held on quitting the service.

LIABILITIES FOR SERVICE.

Company officers of the Reserve may be called up annually for periods of instruction, for reviews, for general inspections, etc. With regard to pensioned or compulsorily retired officers, only those are called up who have a special rôle allotted to them in war-time. Superior officers are only called up when it is proposed to promote them. The law allows exemption from being called up to reserve officers who are studying abroad as well as to those who fulfil certain public functions.

Officers of the Reserve wear the same uniform as officers of their branch of the Service in the Regular Army. During the time they are with the Colours they receive the same pay as the latter. As a rule officers of the Reserve remain on the registers up to the limit of age fixed for the retirement of officers of the Regular Army, that is to say, until 70 for generals of division, 68 for generals of brigade, 63 for colonels, 61 for lieutenant-colonels, 59 for majors, and 55 years for officers of low ranks. They may, however, at their request, and as long as they possess proper physical and intellectual qualities, be retained beyond these limits. —*Bulletin de la Presse et de la Bibliographie Militaires.*

RUSSIA.—Following its declarations repudiating all schemes of territorial annexation in Manchuria, the Emperor's Government has enjoined restrictive measures on the large concentrations of troops mobilised to form three army corps in Siberia and another in the Amur district with a view to offensive operations against China.

The 1st and 2nd Brigades of Riflemen who were to have reinforced the Army Corps in the Far East have returned to their usual garrisons. The 4th Siberian Infantry Brigade and the seven battalions from that province have been demobilised. The Commandant of the Amur Military District will take steps to release progressively all the units under his command commencing from the rear.

Six field batteries and an ammunition park required for the Kasan Military District will not be mobilised. It is the same with regard to the 3rd Engineer Battalion and the 4th and 5th Rifle parks.

After the taking of Mukden the effectives at present in Siberia were under orders to be reduced. The only troops remaining on a war footing are the 3rd, 4th, and 5th Rifle Brigades with their artillery and their means for sea transport. The troops operating in the Pechili remain at their mobilisation effective; those that have crossed the frontier into Manchuria will remain at their war strength only if their commanders consider it necessary from a military point of view. The *personnel* of the military establishments in the Amur and Siberian districts return to a peace footing the 5th Battalions of half the infantry regiments in Siberia will remain at war strength.

The 1st Turkestan Rifle Brigade, detached to Semiritchensk will only retain one complete battalion, the remainder returning to their former cantonments. The Cossack foot brigade and the reserve Cossack batteries will return to their peace strength.

As soon as official relations are re-established with China, the Ukase of the 2nd October orders the return to European Russia of all the troops sent to the Far East and the return to a peace footing of all the troops who are kept at home as reinforcements. —*Le Progrès Militaire.*

NAVAL AND MILITARY CALENDAR.

OCTOBER, 1900.

- 2nd (T.) H.M.S. "Gladiator" commissioned at Portsmouth for Mediterranean.
- 4th (Th.) Lord Roberts issued a Proclamation laying down the treatment to be awarded to Boers who surrendered and to those who were captured.
- " " Terms published on which General Baden-Powell's police force would be enlisted, the period of service being for two years.
- 5th (F.) Launch of third-class cruiser "Amazone" from Germania Yard, Kiel, for German Navy.
- " " A British landing party captured Ching-waw-tao in China.
- 6th (Sat.) Sir Redvers Buller bid farewell to the troops under his command, and left for Cape Town.
- 7th (S.) The City Imperial Volunteers left Cape Town for England in the "Aurania."
- 8th (M.) The Durban Volunteers were disbanded.
- 9th (T.) H.M.S. "Amphion" sailed for Pacific.
- " " H.M.S. "Sybille" commissioned at Portsmouth for Cape Station.
- 11th (Th.) H.M.S. "Pallas" commissioned at Portsmouth for North America and West Indies.
- " " A small British contingent was ambushed by the Boers.
- 13th (Sat.) Brigadier-General Mahon successfully engaged the Boers at Machadodorp, but suffered severe loss.
- 16th (T.) Bethune's Mounted Infantry ambushed Boer commando, who lost 60 killed, 35 wounded, and 65 prisoners.
- 18th (Th.) H.M.S. "Gladiator" left Portsmouth for Mediterranean.
- 19th (F.) Mr. Kruger embarked secretly on the Dutch cruiser "Gelderland" at Lorenzo Marques for conveyance to Europe.
- 20th (Sat.) H.M.S. "Blanche" commissioned at Portsmouth for Cape.
- " " An agreement was announced between Great Britain and Germany, binding the two countries to uphold the principle of free trade for all nations in Chinese ports, and to frame their policy for the preservation of the present territorial condition of the Chinese Empire.
- " " General Weyler was appointed Captain-General of Madrid.
- 22nd (M.) French Transport "Caravane" sunk in Inland Sea, Japan, by collision with Japanese Mail steamer "Yamaguchi-Maru."
- 23rd (T.) H.M.S. "Europa" paid off at Portsmouth.
- " " Launch of first-class battle-ship "Retvizan" from Cramp's Yard, Philadelphia, for Russian Government.
- 25th (Th.) An impressive ceremony was held at Pretoria on the annexation of the Transvaal.
- 26th (F.) H.M.S. "Pallas" left Portsmouth for West Indies.
- " " H.M.S. "Fearless" arrived at Portsmouth from Mediterranean.
- " " H.M.S. "Sybille" left Portsmouth for Cape.
- " " Launch at Pola of torpedo-avisos "Szgether" for Austro-Hungarian Navy.
- " " Jacobsdal was attacked by the Boers, who were driven off. The garrison, consisting of the Cape Highlanders Corps, suffered heavy losses.
- 27th (Sat.) The City Imperial Volunteers arrived at Southampton from Cape Town in the "Aurania."
- 29th (M.) The City Imperial Volunteers marched through London.
- 30th (T.) H.M.S. "Blake" commissioned at Portsmouth for relief service.

FOREIGN PERIODICALS.

NAVAL.

ARGENTINE REPUBLIC.—*Boletín del Centro Naval*. Buenos Aires: September, 1900.—Has not yet been received.

AUSTRIA-HUNGARY.—*Mittheilungen aus dem Gebiete des Seewesens*. No. 11. Pola: November, 1900.—“The Gold Medal Naval Prize Essay: Translation of Commander Ballard's, R.N.” “On the History of Ballistics.” “The Double Turrets of the U.S. Battle-ships ‘Kearsarge’ and ‘Kentucky.’” “Foreign Naval Notes.”

BRAZIL.—*Revista Maritima Brasileira*. Rio de Janeiro: August—September, 1900.—Has not yet been received.

FRANCE.—*Revue Maritime*. Paris: September, 1900.—“A Naval Campaign Under the Empire (1805-1807).” “The Campaign of the Bailli de Suffren in the Indies (1781-1783).” “A Study on the Use of Cold Water Under Pressure for the Propulsion of Ships' Boats” (*concluded*). “English Naval Estimates for 1900.” “Economics in the Arsenals.” “The New U.S. Battle-ship ‘Maine’” “The Lecoine—System of Acoustic Signals.” “Foreign Naval Notes.” “The Mercantile Marine.”

Le Yacht. Paris: 6th October, 1900.—“The Spanish Navy” (*concluded*). “Yachting Notes.” “The New Constructions in 1901.” 13th October.—“Is a Knowledge of Sails Necessary for the Seaman of the Future.” “Yachting Notes.” “The Creusot Pavilion at the Great Exhibition.” “The Sardine Boats of the Sables d'Olonne and Donarnenez.” “The Mercantile Marine: French and Foreign.” “Fishing-Boats at the Great Exhibition.” 20th October.—“The Augmentation of the Corps of Officers and the Rank of Corvette-Captain.” “Yachting Notes.” “New Regulations for the Relief of Ships in the Squadrons in the Future.” “Fishing-Boats at the Great Exhibition” (*concluded*). “The large Five and Six-Masted American Schooners.” “The Inspection Tour of the Ministers of Marine and War to Corsica and Tunis.” “The Reconstruction of the Battle-ship ‘Le Triomphant’ (*temp.* Louis XIV.) at the Great Exhibition.” “The Mercantile Marine at the Great Exhibition.” 27th October.—“The German Navy and the Emperor.” “Yachting Notes.” “The Inspection Tour of the Ministers of Marine and War to Corsica and Tunis” (*concluded*). “The Mercantile Marine at the Great Exhibition” (*continued*). “The Mercantile Marine: French and Foreign.”

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GERMANY.—*Marine Rundschau.* Berlin: November, 1900.—"Frontispiece: Launch of the Cruiser 'Amazon' from the German Yard at Kiel." "The Distribution of the Naval Brigades in Seymour's Relief Expedition and the Fighting at and about Tientsin, June-July, 1900." "On the Determining of the Fighting Value of War-ships." "On Alliances in Naval War." "Proverbs and Proverbial Expressions in Naval Matters, Ship, and Fishing Life in the Roman Languages" (*concluded*). "Medical Conditions on board Ships in the Seventeenth and Eighteenth Centuries" (*continued*). "Naval Notes."

ITALY.—*Rivista Marittima.* Rome: October, 1900.—"The Arctic Expedition under H.R.H. Prince Louis of Savoy, Duke of the Abeuzzi." "The War Navies at the Paris Exhibition, 1900." "The Cost of the Navy and the Replacing of Ships." "The Command of the Sea from the Italian Point of View." "Incidents in the Spanish-American War" (*continued*). Letters to the Editor:—"On Maritime Defence." "Duties of the Navy in Times of Peace." "Submarine Navigation and its Scope in War." "Foreign Naval Notes."

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SPAIN.—*Revista General de Marina.* Madrid: October, 1900.—"Calculations of the Luminous Powers of Lighthouses" (*continued*). "Efficacy of Firing at Sea." "The Defence of Coasts." "The Red Cross at Sea." "The Necessity of Maintaining a Navy." "The War Navies at the Paris Exhibition." "Maritime Japan." "The Construction of Torpedo-Boats." "Increase in the Size and Speed of Ships of War." "The New Italian Torpilleur-de-haute-mer 'Condor.'" "Modern Artillery at the Paris Exhibition." "Guns and Armour." "Naval Notes."

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AUSTRIA-HUNGARY.—*Militär-Zeitung.* Vienna: 2nd October, 1900.—"Politics and War." "Cyclist Detachments." "The Entanglements in China." 10th October.—"The Army and Railway Administration." "German Reserve Colonial Troops." "The Entanglements in China" (*continued*). 18th October.—"The Training of Recruits." "The Entanglements in China" (*continued*). 26th October.—"The November Promotions." "The Entanglements in China" (*continued*).

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FRANCE.—*Revue du Cercle Militaire*. Paris: 6th October, 1900.—“Shooting at the Exhibition of 1900.” “The Transvaal War.” “The Dead who Rule.” 13th October.—“Tactical Lectures” (with sketch and map). “The Transvaal War” (with sketch, *continued*). “Manœuvres of the Danube Flotilla.” “Our Army Criticised by a Foreigner.” 20th October.—“Infantry under German Artillery Fire—Battle Formations, and Formations when nearing the Enemy.” “The Transvaal War” (*continued*). “Our Army Criticised by a Foreigner” (*continued*). 27th October.—“Tactical Lectures” (with map and sketch, *continued*). “The Transvaal War” (*continued*). “Infantry under German Artillery Fire” (*continued*). “Our Army Criticised by a Foreigner” (*concluded*).

Journal des Sciences Militaires. Paris: October, 1900.—“How could Metz be Left in 1870” (*concluded*). “Annam from the 5th July, 1885, to the 4th April, 1886” (*concluded*). “The Siege of Tarragona in 1811” (*concluded*). “Military Dovecots in France and Abroad.” “Two Campaigns of Cæsar” (*concluded*). “The War of Succession in Austria, 1740-1748” (*continued*).

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Revue de Cavalerie. Paris: October, 1900.—“At the Autumn Manœuvres.” “Scouting Operations of the Army of Northern Virginia in the American War of Secession” (1 sketch, *continued*). “The German Cavalry at the Grand Manœuvres of 1899” (*concluded*). “The Lessons of the 16th August” (*continued*). “More Crossing of Rivers.”

GERMANY.—*Militär-Wochenblatt*. Berlin: 3rd October, 1900.—“The German Cavalry on the 7th August, 1870.” “England and the Transvaal” (*continued*). 6th October.—“A New Work by General von Schlichting.” “Review of the Progress of the Imperial Manœuvres of 1900” (*continued*). “The German Cavalry on the 7th August, 1870” (*continued*). “South American Horses.” 10th October.—“The German Cavalry on the 7th August, 1870” (*concluded*). “The Boxer Insurrection in China” (*continued*). 13th October.—“Review of the Progress of the Imperial Manœuvres of 1900” (*concluded*). “Tactical Sundries.” 17th October.—“Tactical Sundries” (*concluded*). “The Boxer Insurrection in China” (*continued*). “Scouting.” 20th October.—“The Manœuvres as a Standard for War Training.” “St. Cyr and its Re-organisation in 1900.” “This Year's Russian Grand Manœuvres at Luga.” “The Boers and their Horses.” 24th October.—“England and the Transvaal” (*continued*). 31st October.—“Frederick the Great's Oblique Order of Battle.” “England and the Transvaal” (*continued*).

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ITALY.—*Rivista di Artiglieria e Genio.* Rome: September, 1900.—“The Sieges, Bombardments, and Blockades of Small French Fortresses during the Franco-German War, 1870-1871.” “On the Use of Expanded Metal.” “A New Instrument for Calculating Ballistics.” “Firing Regulations for the Austrian Fortress Artillery.” “A Heavy Battery at the Relief of Ladysmith.” “Nordenfeldt-Cockerill Field Material.” “Van Royen Pointing Apparatus for Siege Artillery.” “Foreign Military Notes.”

Rivista Militare Italiana. Rome: October, 1900.—“The Military and Economic Needs of the Commissariat.” “The Army Promotion Regulations.” “Mountain Artillery and the Real Alpine Artillery.” “Some Questions on Modern Tactics.” “Manchuria and the Partial Russian Occupation.” “Use of Telegraphists in War” (*continued*). “Foreign Military Notes.”

PORTUGAL.—*Revista de Engenharia Militar.* Lisbon: August, 1900.—“Cross-Staff Topography.” “German Troops for Lines of Communication.” “With Regard to the Minimum Radius of a Parabolic Arc comprised between Two Tangents.”

September, 1900.—“The Effects of the Fire from Ships against the Coast Batteries of Porto-Rico and Santiago de Cuba.” “Trials of Cement: Adaptation of the Michaelis Machine for Trials for the Compression of Cement.” “The Walls of Lisbon” (*continued*).

RUSSIA.—*Voïennyi Sbornik.* October, 1900.—Has not yet been received.

SPAIN.—*Memorial de Ingenieros del Ejército.* Madrid: September, 1900.—“Plans for Economical Coast Batteries” (*concluded*). “The Spanish Military Electric Pile-Batteries.” “Economical Douche Baths in Barracks.”

October, 1900.—“The Spanish Military Electric Pile-Batteries” (*continued*). “The Liquefaction of Oxygen.” “Military Telegraphic Service.”

Revista Técnica de Infantería y Caballería. Madrid: 1st October, 1900.—“The Military Manœuvres in Aragon” (*continued*). “The Cavalry Arm and the Tactical Regulations” (*continued*). “The Transmission of Orders and Reports” (*continued*). “Wounds from Fire-Arms in the Philippine Campaigns.” “The Great Empire of China” (*concluded*). 15th October.—“Spanish Dominion and Wars in the Low Countries.” “The Transmission of Orders and Reports” (*continued*). “The Military Manœuvres in Aragon” (*continued*). “Militarism.” “Reflexions on Cavalry.” “Popular Military Education.”

SWITZERLAND.—*Revue Militaire Suisse.* Lausanne: October, 1900.—“The Employment of Artillery in Action” (*concluded*). “Mountain Manœuvres.” “Military Ballooning in Switzerland.”

NOTICES OF BOOKS.

London to Ladysmith via Pretoria, and Ian Hamilton's March. By WINSTON SPENCER CHURCHILL. London: Longmans & Co. 1900.

When all due allowances are made for the special circumstances under which a war correspondent is compelled to do his work—the cries of his employers for sensational details, the impossibility of waiting for accurate confirmation of news at critical moments, etc.—these two books² deserve the praise which has been bestowed upon them.

Anyone who has endeavoured to form an accurate picture of the campaigns of, let us say, the last century, knows how eagerly one turns from the dry-as-dust details to some chance private letter which reveals to the reader what life at the front really seemed to those in the thick of it—whether the men felt their losses and hardships, whether they trusted their officers, and what the camp gossips prophesied of the future. These books give all one requires of this nature and reveal the spirit of the men most admirably. They would have been worth whole reams of cavalry scouting reports had they fallen into the enemy's hands, as they easily might have done while in process of transmission. That they passed uncensored points to the conclusion that private correspondence was not so frequently tampered with as dissatisfied camp-followers have asserted.

An expert staff officer, who had studied his enemy in time of peace, both on the manœuvre ground and as revealed in his regulations and literature, would have learnt from Mr. Churchill's pages exactly how far it would be safe to "bluff" in manœuvring against him, to what extent it would be safe to extend his front across his line of advance, without running the risk of a concentrated effort to break through.

If on that unfortunate morning in December the Tugela had been only three feet deep, and not from seven to ten, as it actually proved to be, there can be little doubt that Colenso and the heights around it would have fallen to our first rush, and, as a consequence, the bugbear of the magazine rifle would have been exploded, and the views of those who hold that the fire-power of a strong line is its best protection would have triumphed. But the contrary was the case, and opinion swung round to the other extreme, viz., that cover for the individual is the first consideration, forgetting that it is a physical impossibility to take cover and to advance at the same time; yet without an advance the Boer was not to be driven from his trenches. As a consequence, a form of attack was adopted which, against any other enemy but the Boers, could have had no hope of success whatever, viz., in lines of skirmishers extended at ten, twelve, and latterly in the Transvaal to thirty paces interval, backed up by similar lines each at 200 yards distance. Fortunately for us, the Boers rarely had men enough to hold their positions adequately; had they met our advance everywhere with a single line with one man to the pace, then every rifle on our side which could be used would have been opposed by 10, 12 or 30 rifles on the other, and the chances against our men individually would have been not only 10, 12 or 30 to one, but $\frac{10}{1}$, $\frac{12}{1}$ and $\frac{30}{1}$ to one—odds against which no living thing could endure for the time it would take the following lines to reinforce.

Thus, through over-caution and incorrect tactical reasoning, our men were actually exposed to a far greater danger than was in any way necessary.

How deep was the impression created by the Colenso misfortune is evident between every line of the author's writing; he himself, though not present on that occasion, had imbued the spirit so thoroughly that on the eve of the advance to Potgieter's Drift he records his opinion that it will cost thousands of lives to get

through to Ladysmith—whereas as a fact the losses incurred in 28 days of almost consecutive fighting under extreme difficulties in the way of combined action did not amount to one thousand killed all told—not a heavy percentage on a total of not less than 20,000. Under the circumstances the spirit the men showed was superb; they all believed they were about to face extreme risks, yet neither in Mr. Churchill's nor in any other private or public communications is there any indication of undue nervousness under fire, except momentarily at Spion Kop, where the circumstances excuse many things.

Mr. Churchill evidently thought little of artillery fire at the outset; yet he admits he came off that hill with a modified opinion, though he tells us that the shells were bursting over the plateau only at the rate of seven a minute. This is a case where the "ounce of practice is worth a ton of theory" proverb does not apply. We have very few infantry officers who have seen artillery in action since the Crimea, and as a consequence many do not believe in artillery preparation any more than our author did, and are therefore inclined to ridicule the opinion of foreign officers who, when speaking of artillery preparation picture to themselves, let us say, St. Privat with 200 guns crashing shells into it at a rate ten times as great as that which at Spion Kop proved unendurable.

Mr. Churchill thinks little of the future prospects of cavalry on the battle-field. With all humility we venture to differ from him. In the whole of his two volumes we find no instance of a horse dropped dead in his tracks by rifle fire, and we feel pretty certain that had such an event occurred either he or his colleagues (whose works we have also searched in vain) would have noticed it; yet if modern humane bullets will not stop a horse in, say, fifty yards, the prospect of these widely-extended lines, which after all cannot pump out one quarter the number of bullets that failed to stop Bredow's Brigade in 1870, does not appear to be at all an enviable one. To stop a horse outright, a direct hit through the brain, spine, or heart is absolutely necessary; an animal can go a long way, even with a man on its back, on three legs, and the total area of the fatal surfaces is only a few square inches. Hence, if unshaken Boer marksmen, firing for ten hours at an unprotected motionless target of some 10,000 men, only partially disabled some 10 per cent., how many horses will they kill outright when they themselves are heavily shaken by Maxim and shell fire, in the space of time it will take the cavalry to traverse, say, 500 yards at speed?

Incidentally we would ask whether it is fair to ask the infantry to stand up to the terrible wounds the lance can inflict, with only a bullet guaranteed not to disable his adversary to defend himself with?

Throughout the book we are irresistibly reminded of an anecdote: General U. S. Grant used to tell against himself. It was at the very outset of the Civil War, when Grant was manœuvring against a Confederate General named Harris. For weeks nothing decisive happened; when Harris advanced, Grant dodged, and *vice versa*. "I was very much afraid of Harris," said Grant; "but one day it occurred to me that probably Harris was quite as much afraid of me, and on the next opportunity I let him have it, and Harris went under. I never forgot that lesson." Certainly it led him into several bloody traps, but it ended the war and saved the Union.

Essai historique sur la Tactique de Cavalerie. Par le Commandant G r me, Brev t  d'Etat-Major. Paris: Henri Charles Lavanielle. 1900.

An historical essay on cavalry tactics which contains no mention of Cromwell, and in which Seydlitz is spoken of as a colonel serving under Ziethen in the Seven Years' War, reminds one somewhat of the play of Hamlet with the character part omitted. Nevertheless, the book does contain a useful summary of the evolution of cavalry in the French Army, and particularly during the early years of this century.

Though much space is devoted to the campaign of 1870, the work is very superficially executed, being mostly taken from the Prussian official account, with

various emendations to meet the public taste. Thus we are told that Bredow's Brigade at Vionville penetrated through the intervals of the French infantry, whereas, as a fact, they rode right over them. The heavy total loss of the brigade is also dwelt on, but the fact that nine-tenths of this loss occurred after, and not before, the infantry had been ridden over is carefully suppressed. Neither is the formation of the infantry mentioned, yet it is obvious that it makes all the difference in the value of the lesson received whether the infantry were in two-deep lines or extended skirmishing order. It is not the men that stop the horses, but the bullets the former discharge, and useful tactical deductions can only be arrived at when it is borne in mind that it is the stopping power alone of the bullet which signifies, the name of the rifle or of its maker being quite immaterial. One is sometimes tempted to wonder whether, if the problems connected with fighting at sea had been dealt with in the same loose manner and expression as the question of fighting on land, the existing types of battle-ships would ever have been evolved.

The latter part of the book deals with the successive alterations in Cavalry Regulations since 1870 in both France and Germany, and is characterised by far more of the true cavalry spirit than the rest of the work.

La Cavalerie au Combat dans les Guerres de l'Avenir. Études de Tactique Appliquée. Par P. S. Paris: Berger-Levrault et Cie. 1899.

This pamphlet of 186 pages is the work of a man thoroughly imbued with the true cavalry spirit, who recognises the power of the arm to act either by shock or fire, and understands the limitations of both.

The first part consists of fourteen separate studies in minor tactics, the latter of an equal number of problems for the cavalry division, both in covering the operations of the other arms and in combination with them on the battle-field.

As far as our present information on the events in South Africa extends, there is nothing except a slight re-adjustment of the distances given to render this work well adapted to present needs.

A similar work in our own language would be gladly welcomed.

PRINCIPAL ADDITIONS TO LIBRARY DURING OCTOBER, 1900.

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Operations of General Gurko's Advance Guard in 1877. By Colonel EPAUCHIN.
Translated from the Russian by H. HAVELOCK. 8vo. London, 1900.

Cyclist Drill. Official. London, 1900.

Famous British Regiments. By Major A. GRIFFITHS. Crown 8vo. London, 1900.

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The Great Boer War. By A. CONAN DOYLE. 8vo. London, 1900.

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Standing Orders and Interior Regulations of His Majesty's 41st Regiment. Crown 8vo. Madras, 1830.

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- Cape Garrison Orders for 1807 and 1808.* Manuscript. Oblong 8vo.
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- A History of Rhodesia.* By H. HENSMAN. Crown 8vo. London, 1900.
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- The Tale of a Field Hospital.* By F. TREVES. 8vo. London, 1900.
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- From the Cape to Cairo.* By E. S. GROGAN and A. H. SHARP. 8vo. London, 1900.
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- The Transvaal War—The Boer Version.* *Standard and Diggers' News* from 3rd October, 1899, to 30th May, 1900. Folio.
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- The Story of the War in South Africa, 1899-1900.* By Captain A. T. MAHAN, U.S.N. Crown 8vo. London, 1900.
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- An Estimate of the Comparative Strength of Great Britain and of the Losses of Her Trade from Every War since the Revolution.* By GEORGE CHALMERS, F.R.S.S.A. 8vo. London, 1810.
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- Notes on Transports on Camel Corps.* By Major D. B. BURN. Official. Crown 8vo. London, 1887.
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- Instruction et Conduite de la Cavalerie. (Traduit de l'Allemand.)* By C. DE PELET-NARBONNE. 8vo. Paris, 1896.
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- A Sketch of the Rise, Progress, and Termination of the Regular Corps, formed and commanded by Europeans, in the Service of the Native Princes of India.* By L. F. SMITH. Imperial 8vo. London, 1805.
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- Manuel Equestre de MM. les Officiers d'Infanterie.* ANON. Pamphlet. Paris, 1900.
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- L'Armée de l'Ancien Régime.* By L. MENTION. 8vo. Paris, 1900.
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- Soldiering in Canada.* By Lieut.-Colonel G. T. DENISON. 8vo. London, 1900.
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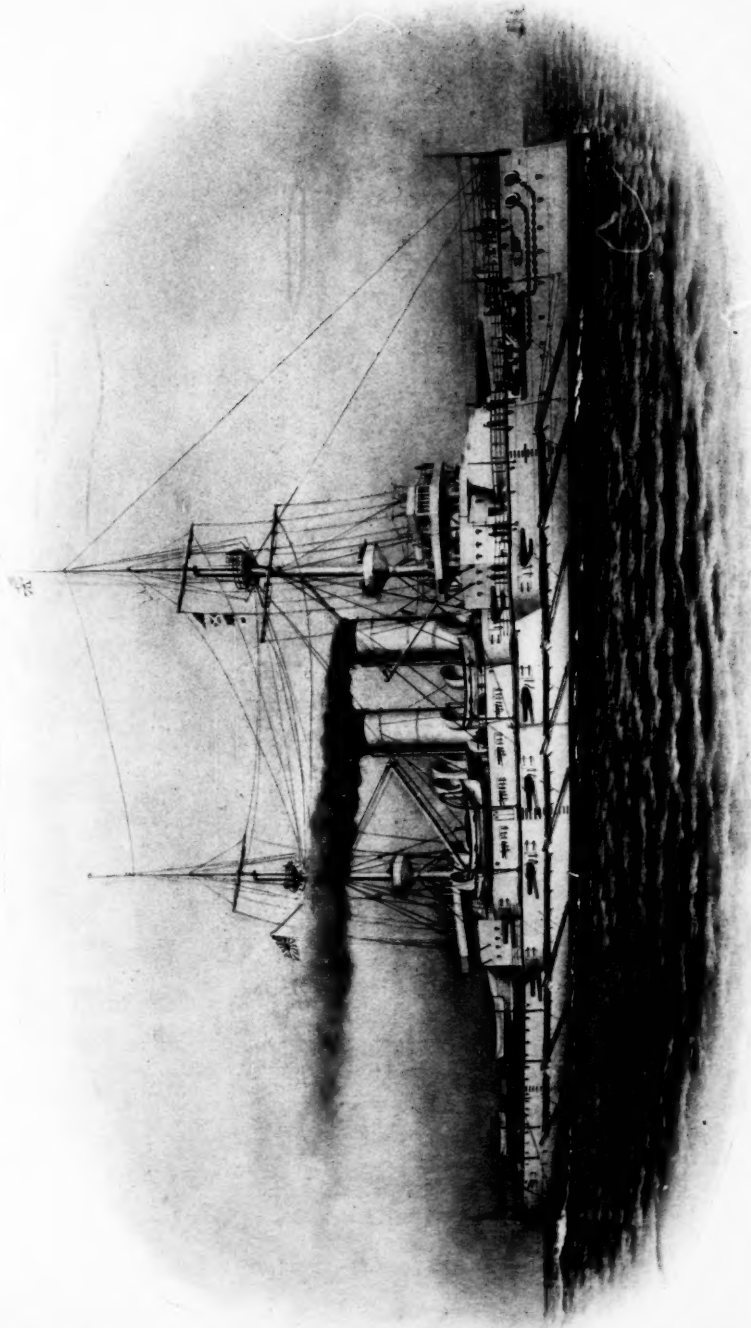
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